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VOLUME XV.
NUMBER 11.

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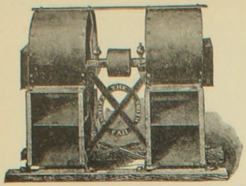
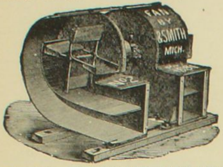
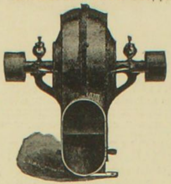

Double Exhauster—Front, showing Four Patented Discharge Openings, where others have only Two.



Section showing TWO Patent DISCHARGE CHAMBERS for EACH Fan Wheel, where others have only One.

PRESSURE  BLOWER.

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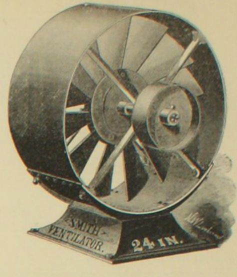
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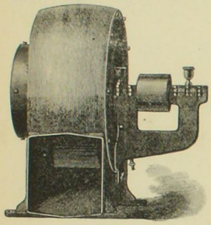

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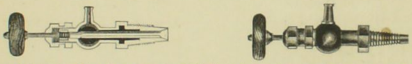

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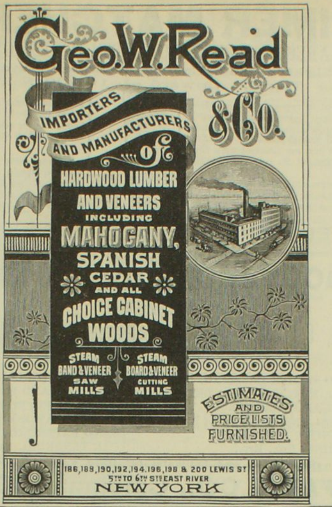

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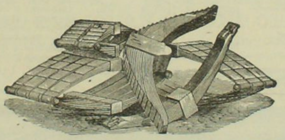

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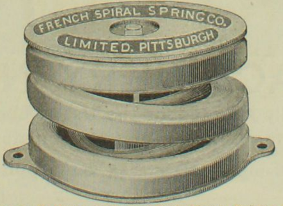

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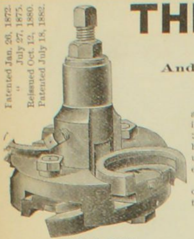

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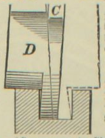

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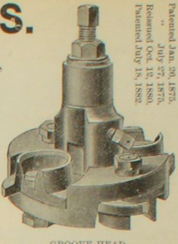

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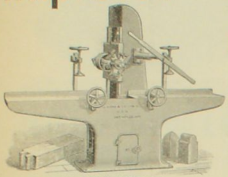

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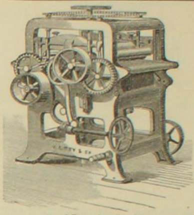

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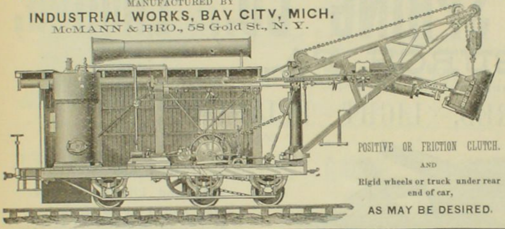

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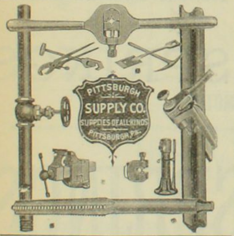
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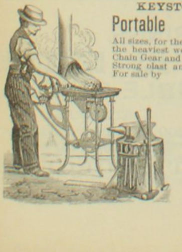

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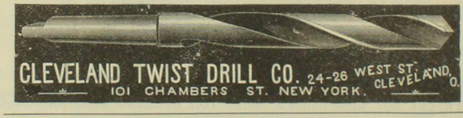

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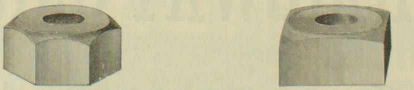

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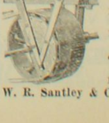

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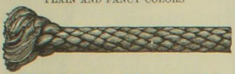

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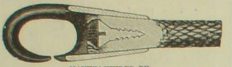

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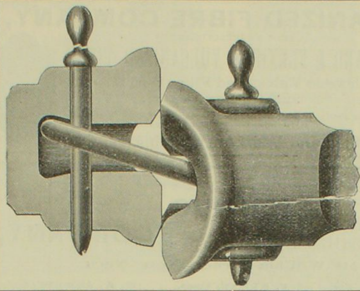

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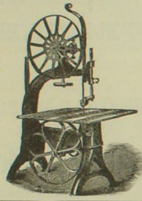

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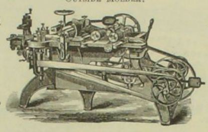

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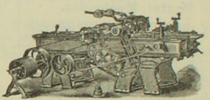

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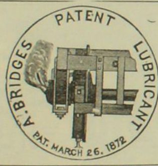

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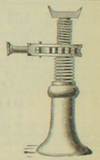

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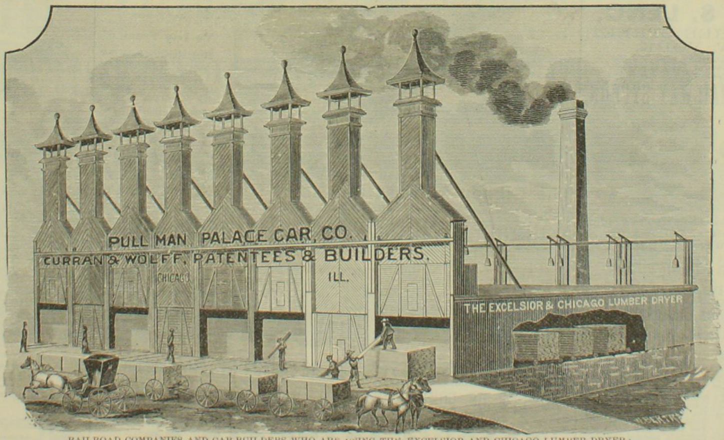
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CURRAN & WOLFF, PATENTEES & BUILDERS.
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THE EXCELSIOR & CHICAGO LUMBER DRYER

DRYING 8,000 FEET PINE LUMBER EVERY 24 HOURS.

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WELLS & FRENCH CO., BRIDGE AND CAR-BUILDERS, CHICAGO, Nov. 13, 1880.

Messrs. Curran & Wolff, City:

GENTLEMEN: In reply to your favor inquiring as to the two Dry Kilns you built for us two years ago, we take pleasure in saying that they have given us entire satisfaction.

We are drying upward of ten thousand feet of inch boards in each Kiln every twenty-four hours, and the lumber comes out of the Kilns free from checks or damage of any kind resulting from the process.

We have concluded to build another of your Dry Kilns, finding them indispensable in our business, and we do not see how any one doing business requiring a large amount of lumber can get along economically without them.

Yours truly,
THE WELLS & FRENCH CO.
H. L. NORTON Sec. and Treas.

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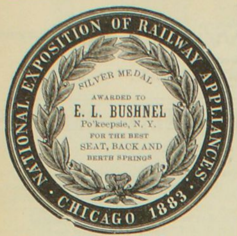

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NOTICE.—To build an efficient wrecking car, many of the main features of this car would have to be incorporated into it, which would be an infringement of my patents. Such cars are being built by the undersigned (having special tools for the work) at very reasonable prices, and no charge made for the patent rights, which would have to be paid for by the user if made by an unauthorized person.

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FOR SUPPLYING LOCOMOTIVE TENDERS FROM ANY BODY OF WATER WITHIN REACH.

WELDLESS STEEL TUBES,

SMOOTH INSIDE AND OUT.

THIS HAMMER

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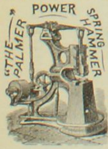

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Superior in every point to any modification of the Trip Hammer. Simple, Powerful, Efficient and Cheap. Four sizes now being built. For Prices and Descriptive Circulars, address the manufacturers,

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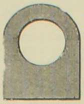

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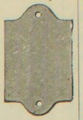

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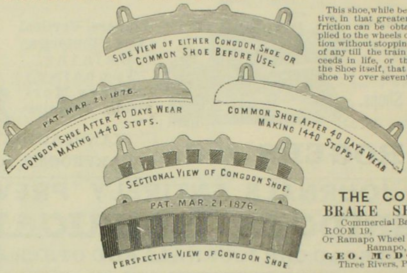
SIDE VIEW OF EITHER CONGDON SHOE OR COMMON SHOE BEFORE USE.
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CONGDON SHOE AFTER 40 DAYS WEAR MAKING 1440 STOPS.
COMMON SHOE AFTER 40 DAYS WEAR MAKING 1440 STOPS.
SECTIONAL VIEW OF CONGDON SHOE.
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This shoe, while being more effective, in that greater uniformity of friction can be obtained when applied to the wheels of a train in motion without stopping the revolution of any till the train is at rest, exceeds in life, or the durability of the Shoe itself, that of the cast iron shoe by over seventy-five per cent.

Its durability, together with cheapness and simplicity of construction, recommend it in preference to any other in use

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THE GIBBON BOLTLESS RAIL JOINT CO.

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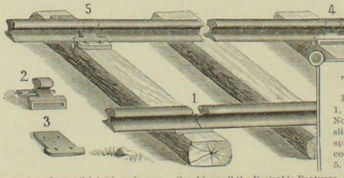

To Lay Track:

First, place the Rails No. 1, then put down No. 2 on No. 1, as shown in No. 4, slide No. 3 into No. 4; spike down, and Joint is complete, as shown in No. 5.

The most perfect rail joint in existence. Combines all the Desirable Features of the Old Chair Joints and Modern Angle Plates, and has none of the Objectionable Features of Either.

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Manganese Bronze and Brass Castings,

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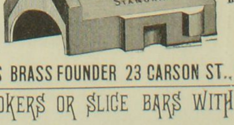
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MANUFACTURED BY

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Are doing all you claim for them, in use some ten months and clean no fires where they are. Putting them in all engines as fast as they come in the shop. We run our engines the long run, 228 miles, and when they get through the fire is as clean as when starting out. Ten months in use.

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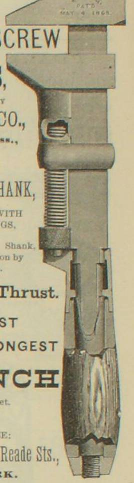

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FERRULE MADE WITH
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Iron Tube Fitted to Shank, held rigidly in position by handle and nut.

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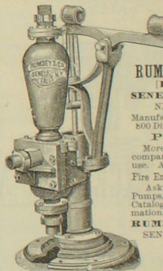
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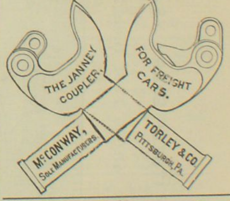
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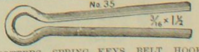

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Pushers, Giant Car, $5.00 each.
Poor's Manual, 1880-81 and 82.
See p. 53.
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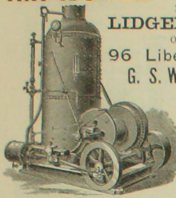

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OFFICE AND SALESROOMS,
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Over 150 different sizes and styles for ALL PURPOSES.

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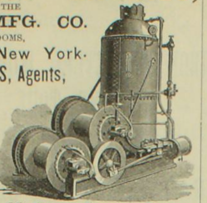

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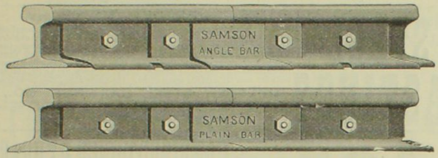
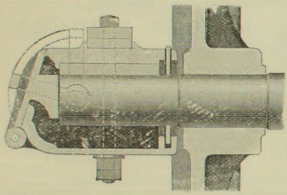


And Every Variety of Plain and Angle Splice Bars.
OFFICE. 6 ASHLAND BLOCK.... ....Mill. Chicago Ave. and the River. .... .-.-CHICAGO.



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This box is designed to provide an end stop for the axle, and thereby dispense with the shoulder and collar, and at the same time not obstruct the process of packing the box. The journal may be made any desired length and diameter. The life of the axle is doubled. The expense of brasses and lubricants enormously reduced; end wear of brasses and hot boxes obviated. It is now in successful operation on trucks of engines, tenders, passenger and freight cars. For further information address

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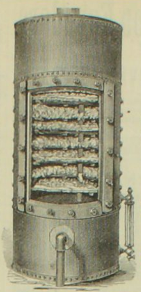

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PATENT LIME-EXTRACTING
HEATER AND FILTER
COMBINED,

Is the only lime-extracting Heater that will prevent scale in steam boilers, removing all impurities from the water before it enters the boiler.
Thoroughly tested.

OVER 3,000 OF THEM IN DAILY USE.

This cut is a fac-simile of the appearance of a No. 5 Heater at work on ordinary lime water when the door was removed, after the Heater had been running two weeks.

Illustrated Catalogues.

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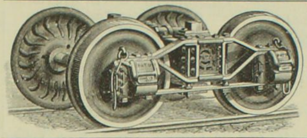

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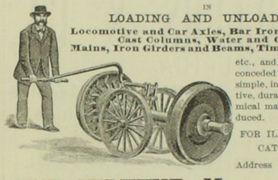
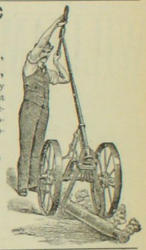
THIS TRUCK IS AUTOMATIC

IN
LOADING AND UNLOADING
Locomotive and Car Axles, Bar Iron, Shafting, Cast Columns, Water and Gas Mains, Iron Girders and Beams, Timber, Stone,



etc., and is universally conceded to be the most simple, ingenious, effective, durable and economical machine yet produced.



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JOHN TERHUNE, Manager,
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THE STANDARD CAR HEATING AND VENTILATING CO.,

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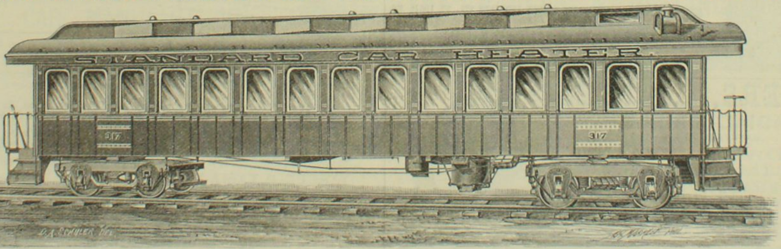
MANUFACTURERS OF

LOW PRESSURE STEAM HEATING AND VENTILATING APPARATUS FOR RAILWAY CARS.



SHOWING POSITION OF HEATER BENEATH THE CAR.

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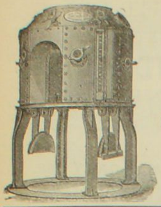

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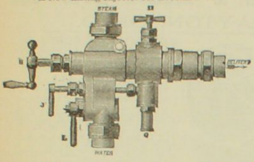

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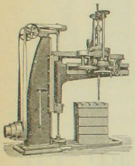

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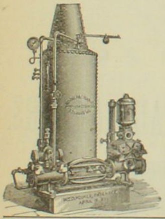

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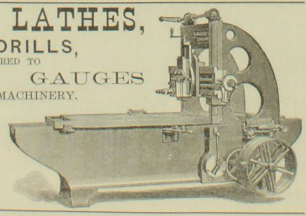

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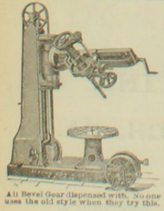

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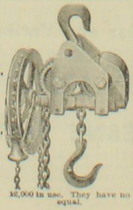

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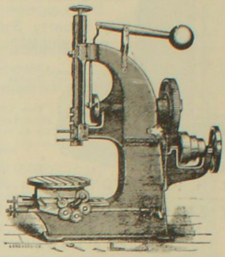

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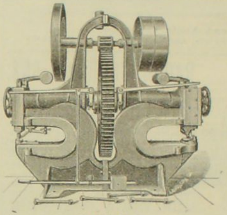

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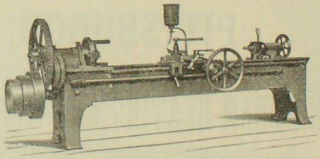

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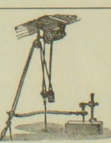

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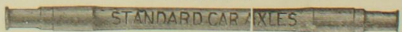

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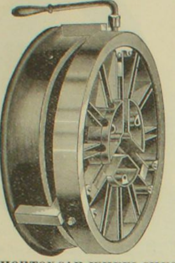

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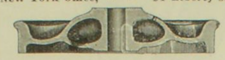

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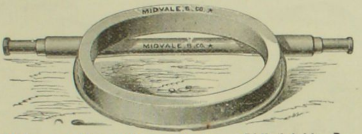
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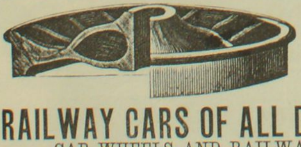

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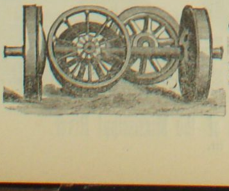

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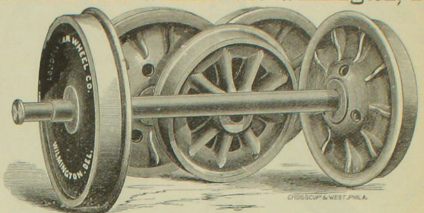
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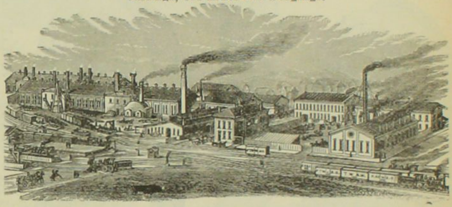

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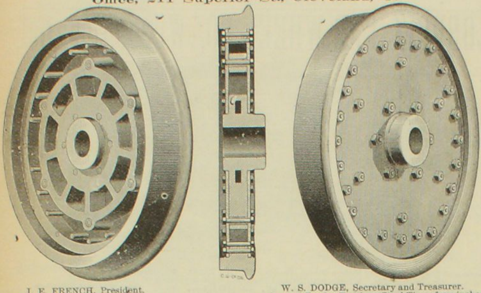

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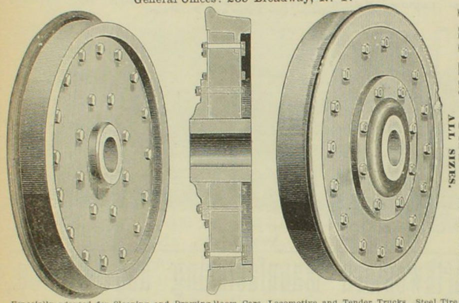

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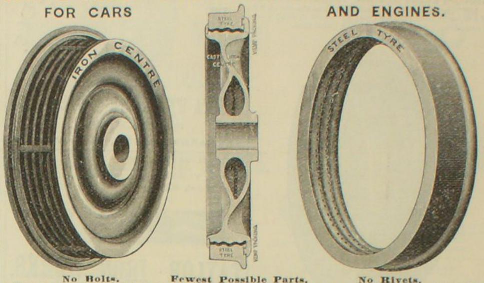

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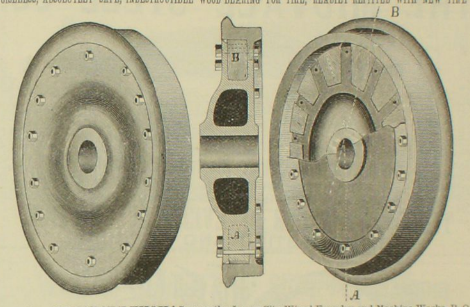

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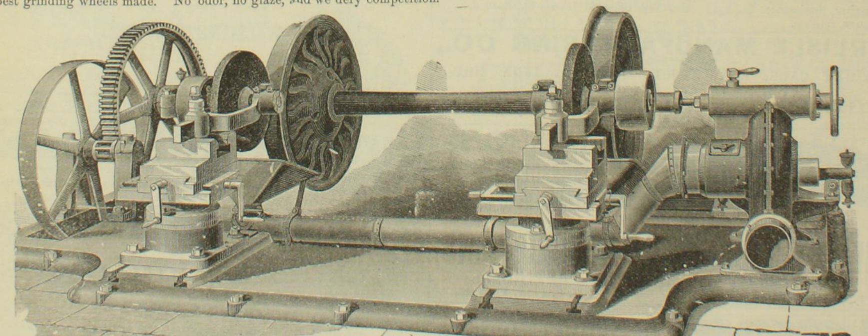

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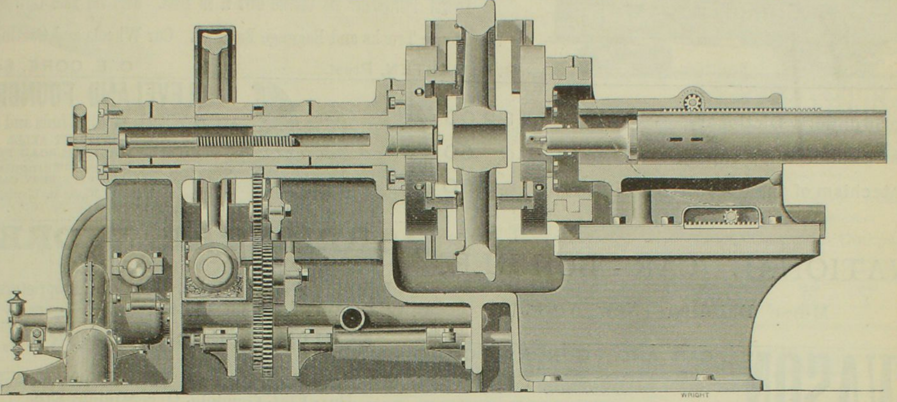

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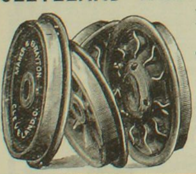

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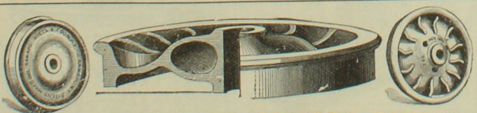

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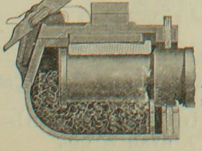

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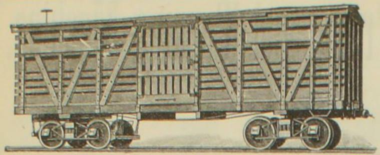

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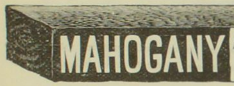

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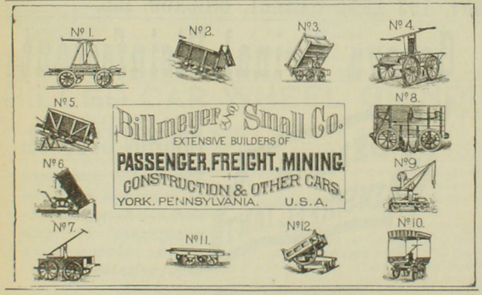

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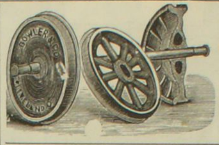

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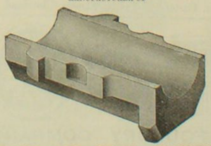

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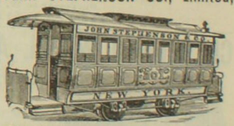

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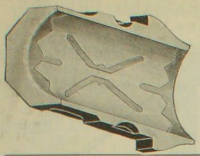

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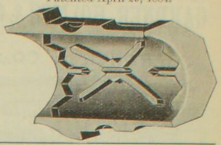

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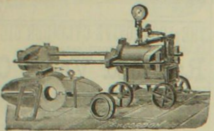

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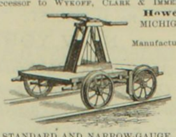

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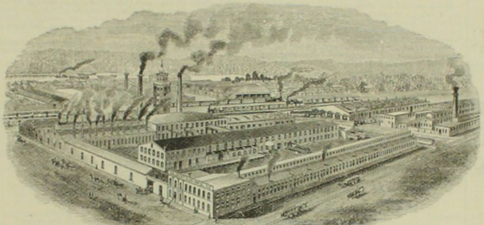

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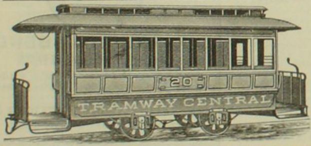

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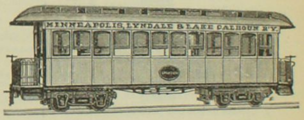
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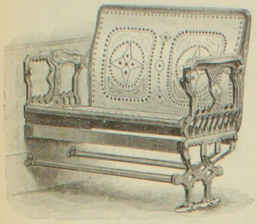

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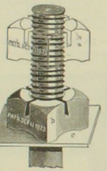

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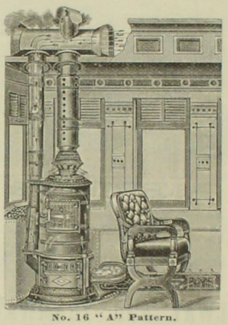

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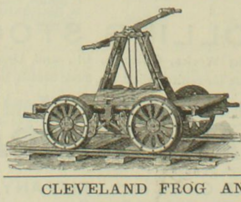

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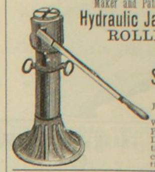

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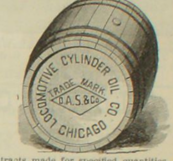

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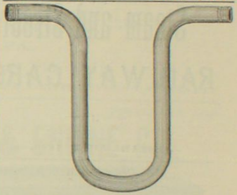

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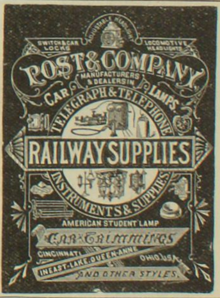

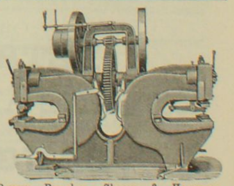

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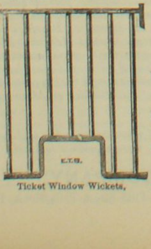

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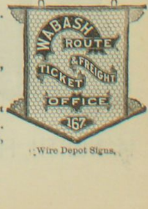

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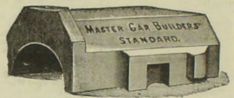

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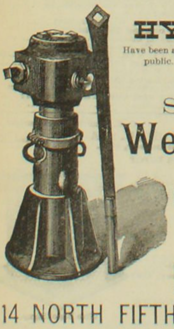

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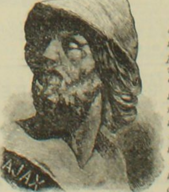

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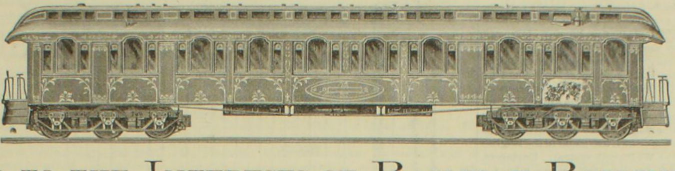

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Miscellaneous Items.

IT is said that the Georgia Pacific Railroad Company will erect machine shops at Birmingham, Ala.

THE Southern Car Works, Knoxville, Tenn., are building an addition to their works, and will put in some new tools.

THE Dickson Manufacturing Co., Scranton, Pa., are building five consolidation locomotives for service on the Erie & Wyoming Valley road.

THE E. HORTON & SON COMPANY, Windsor Locks, Conn., have brought out a new car-wheel chuck, upon which a patent is pending, and have added two new sizes to their regular lathe chucks, viz.: 5″ and 22″.

THE Rhode Island Locomotive Works have contracted with the Brooklyn Elevated Railroad Co. to build 30 locomotives similar to those on the New York elevated roads The specifications call for steel tired wheels of approved pattern and French's springs.

MR. U. H. KOHLER, General Master Car-Builder of the Wabash, St. Louis & Pacific road, has resigned his position and is succeeded by Mr. M. M. Martin. Mr. Kohler has been in the employ of the "Wabash" for over twenty years, commencing as a car repairer, and rising to the highest position in his department.

Mr. JOHN C. ELLIS died on his farm near Schenectady, N. Y., Oct. 4. He was one of the owners of the Schenectady Locomotive Works, and was for several years President of the company, succeeding his father about 1878 and serving for several years, when he retired and was succeeded by his brother, Mr. Charles G. Ellis.

AT no time in the history of the country has copper been so cheap as it now is—13 cents per pound. Brass castings are correspondingly low—from 18 to 21 cents per pound. The low price of copper is due to increased sources of supply from Arizona and elsewhere, which has broken up the monopoly held by the Lake Superior mines so long.

THE Boston & Albany and the Eastern railroad companies have recently adopted the steam driver and tender brakes manufactured by the American Brake Co., of St. Louis. These brakes are an efficient auxiliary for securing the safety of passengers, and are also being generally applied to freight and switching engines throughout the country.

THE Lackawanna Coal & Iron Company have concluded a contract with the Canadian Pacific Railroad for 10,000 tons of steel rails delivered in Canada at $28.50 per ton. This is believed to be the first contract of steel rails made by an American interest as against the English steel rails delivered in Canada, the product and manufacture being entirely American.

AT a meeting of the Engineers' Club of Philadelphia, held on Oct. 4, the secretary presented, for Mr. S. N. Stewart, a description of a gravity elevated railway, the stations of which are placed at summits of grade, so the trains may be slackened and stopped by gravity, and the elevation thus gained utilized in the further gravity propulsion of the train. A compound wheel is also proposed to lessen the rolling friction. Among the advantages noted are avoiding the annoyances of locomotives and heavier construction to provide for their weight, that cars could be run singly as in trains, economy in running expenses, etc.

A STOCK company is being organized in Allegheny City to manufacture the T. P. Cordrey patent rotary dumping car and the "Eureka" coal and ballast car on an extensive scale. Mr. Cordrey, who was formerly engaged in the manufacture of these cars at Massillon and Canton, O., has of late been occupying the car-wheel works in Allegheny, at one time occupied by J. L. Gill, Jr. When these works are running full, about 150 experienced and skilled workmen will find steady employment. Two large engines, respectively 120 and 80 horse-power, furnish the motive power for the extensive machinery, which is all of the most approved designs, and combines all the latest improvements.

THE Morgan's Louisiana & Texas road is having constructed at the Baldwin Locomotive Works a 16x24 inch cylinder engine, which when completed will be a magnificent specimen of machinery. The engine will not be turned over to the Morgan Company until after the World's Exposition, as the builders design exhibiting it as a model locomotive. The engine is very plain in appearance, the usual brass ornamentation being in a great measure dispensed with ; but particular attention has been paid to the steel and iron work, and excellence in point of durability, power and speed aimed at. The stack is plain and straight, without bands, and the boiler an extended front. The driving wheels are five feet in diameter, and, when the exhibition is over, the locomotive will be used in the passenger train service on the Morgan road.

THE Minneapolis *Evening Journal* says that the Minneapolis & St. Louis road has adopted a new brake for their freight cars, which is destined to supersede the old chain brake, as the air brake has on passenger trains. The new invention is designated the Laufman Screw Brake. It has been experimented with and tested on the road and found to work perfectly. It retains the wheel and rod of the old brake, but does away with the ratchet and dog and chain, and works with a screw and lever. It can be set as quickly as an air brake, is simple, and requires so little strength that a child six years old can handle it. When it is once set it will remain so until released, no jar being able to move it. At the lower end of the rod there is a wheel which permits the brake to be worked while the operator is standing on the ground. Statistics show that the old brakes cause fully one-half of the accidents that occur on the road. The brake will be put on the new cars of the road as fast as the cars are constructed.

MR. GEO. H. COLBY, Master Mechanic of the Boston & Albany road, has invented a coupling for locomotive tenders, which in effect continues the Miller hook throughout the entire passenger train. There are no links and pins to break, no slack to be taken up, no jerking or pounding in starting or stopping, and no swaying motion of the tender and forward car. It consists mainly of a heavy casting which is attached to the tender frame and holds the Miller hook, a spring bunter and the means of operating the draw-bar. The forward end of the draw-bar is pinned to a heavy-threaded, spring-encircled bolt, secured under the tender, between the frames, in a strong casting. A spiral spring, secured to the draw-bar immediately behind the bumper beam, draws the head into the position it occupies when coupled. The uncoupling is done by a wheel and staff, which operates a chain and ratchet. The invention is being applied to the passenger engines of the Boston & Albany and several of the Eastern railroads, and locomotive builders have adopted it as their standard for passenger engines.

THE Brisbane (Australia) *Courier*, of August 5, speaks of a new postal car, invented by Mr. G. R. Harrison, formerly a mail agent on American railways, and for which Mr. Carson Woods, of Sydney, is the Australasian agent. The car is described as having a hundred conveniences for sorting very large mails, and yet providing three or four times as much space as there is on ordinary cars of the same size and class. Two of them, each 40 feet long, have been ordered by the New South Wales government at a cost of £1,000 each. Mr. Woods is also the agent for what is known as Scott's sleeping-car, which is said to be superior in some respects to other more costly sleepers in use in Europe. The chairs are fixtures, and are arranged in pairs, the two chairs facing each other. The seats draw out and form the lower berth, while the backs of the chairs can be raised and so fitted as to form the top berth. The great advantage in these berths is the splendid ventilation provided, each berth having a separate window. The cost of these cars 60 feet long and suited for a 4 feet 8½ inch gauge would be £2,000. It is also stated that two of the Leve & Alden palace cars are in use in New South Wales, and that screw-lever dump-cars, of which Mr. Woods is the patentee for Australia, will soon be submitted for inspection to the Queensland railway authorities.

THE Reading (Pa.) *Eagle*, of October 17, says: The first of the four monster 8-wheeled engines to be run on the Bound Brook road was turned out of the Philadelphia & Reading shops this morning. It was submitted to a highly satisfactory test. The other engines are also well under way at the shops. They are intended for passenger traffic, and their method of construction, it is claimed, will enable them to make extraordinarily fast time. An ordinary engine looks like a mere dwarf alongside of these giants. The latter are well known as belonging to class D, 44. The weight of the different classes of engines varies all the way from 11 to 46½ tons, the latter being considered extraordinarily heavy, but the engine turned out this morning weighs over 100,000 pounds. The stroke of the cylinder is 21×22 inches. The driving-wheels are immense affairs, and measure 5 feet 8½ inches in diameter. The diameter of the truck wheels is 33 inches. The length of the boiler is 26 feet 10½ inches, and the dimensions of the fire-box are as follows: Inside, 9 feet 6 inches by 8 feet; outside, 10 feet 4¾ inches by 8 feet 8½ inches. Its height is 14 feet 5 inches, and its extreme length 34 feet 7 inches. The total length of engine and tender is 58 feet 8½ inches. The capacity of the tank is 3,500 gallons. Buckwheat coal will be burned by this engine, which is probably the largest ever built in this city. The very best of workmanship and material has been used in its construction, and old engineers pronounce her "a beauty."

IN the case of the National Car-Brake Shoe Company vs. Terre Haute Car & Manufacturing Co., before Justice Woods in the U. S. Circuit Court, District of Indiana, the following observations were made:

> In an action at law for infringement of a patent all parties who participate in the infringement are liable, although some are simply acting as officers of a corporation. All parties who participate in a tort or trespass are liable, and a man cannot retreat behind a corporation and escape liability for infringements in which he actively participates. * * * * On a question of damages it is competent for a patentee to prove the prices at which licenses were granted under the patent while it was in force; but in order to be competent evidence of value, the prices agreed upon must have been prices fixed with regard to the future use, when, there being no liability between the parties, they are presumed on both sides to have acted voluntarily, and therefore to have made up their minds deliberately as to what was a fair price. Such arrangements, licenses thus granted, fees thus fixed are competent evidence to consider in determining what the actual value of an invention is, and what the recovery ought to be for its use. * * * * The value of an invention for which an infringer is liable is the value at the time of the infringement. A man who has got a patent owns it as property, and if anybody sees fit to infringe it he is bound to pay for its fair value, and the fact that there is something else just as good or better does not entirely destroy its value, but may affect it. * * * * Every one is bound to take notice of the existence of a patent and of the rights of parties under it. Like the record of a deed to real estate, the record of a patent at Washington is notice thereof to all the world.

A Handsome Pay Car.

Paymaster Johnson, of the Fitchburg Railroad Co., with his two assistants, started this morning on the regular monthly trip over the road, using for the purpose the new pay car which was turned out of the company's shops last week. This car, which is a model of its kind, is elegantly and conveniently fitted up, and is so arranged that it can be used—and it is so intended—for a directors' car. The car is of the usual length and has Allen's standard paper wheels, with Marden's patent malleable steel brake-beam. One end or nearly one-half of the car is devoted to the paymaster's office, a wide black-walnut counter running nearly across the car, underneath which is the safe, and in front and behind which also suitable closets for books, papers, etc., are provided. An apartment in the centre of the car contains the Baker heater, lavatory and toilet, all so placed as to be convenient, and yet utilizing every foot of room.

In the rear of this apartment and in the other half of the car is a folding bed and elegantly upholstered easy chairs provided for the directors. In a locker beneath the car are carried two cot beds, which can be used when needed in the directors' apartment, either by the officials or—when, as now, the car is used by the paymaster—by the paymaster's assistants. An oil stove with all its furnishings is also a part of the equipment of the car, and this, with such provisions as may be required, finds a place in a large closet in the directors' room. Three tables that can be lowered or raised at will are hinged on either side the car behind the large chairs. The whole interior is furnished in solid mahogany and the panels of birdseye maple. Large observation windows are provided at both ends, and these, as well as all the other windows, are handsomely and elegantly curtained. The floors are highly polished and covered with rugs, and the furnishings throughout are well in keeping with the rich and substantial finish.—*Boston Traveller, Oct. 13.*

Mr. Coleman Sellers on the Metric System.

Mr. Sellers, while in Europe a few weeks ago addressed a letter to the Philadelphia *Ledger* stating his observations in regard to the extent to which the French metric system prevailed abroad. He found that in Norway, Denmark and Sweden, where its use was said to be compulsory, it was practically used only in government depots and by employés of the government, the people at large knowing little or nothing about it. In Germany it was used because it was thought better to have some uniform system instead of the numerous measurements that had formerly been in use. The unit in machine shops was the millimeter, except in bolts, nuts, and screws, which are made to the English inch in conformity to the Whitworth system. Engineers, however, did not like the metric method because it has too small a unit, and the meter is too large and involves the use of decimals. The following is the concluding portion of Mr. Sellers' letter :

"In Philadelphia the firm of William Sellers & Co. adopted the French metric system in an important part of their works as long ago as thirty years, and have continued its use since, until their workmen are as familiar with it as with the inch. With all this long practice during my connection with the firm, I have written and spoken against the enforced adoption of the system, not only because of the expense involved in changing, but because it is not a practical system ; it permits of no elastic gradation of shop or trade sizes. The millimetre is taken as the standard to avoid the complication of the constant use of decimals, as nearly all measurements in machine work are less than one metre. This small measure involves many figures, and does not permit any good memorizable series. The inch cut up into the natural division by constantly halving, permits the use of sizes best suited to the needs of the workmen.

"The standard of the French system is a certain bar, kept for comparison; so is the English yard, from which we get our feet and inches. The high-flown notion that the metre is a measurable portion of the quadrant of the earth's circumference has been given up long ago, and the measurements of England and America are on a better basis of accuracy to-day than that of any other country. The French system theoretically predicates its weights on the weight of a cubic decimeter of distilled water at a temperature of 39.1 deg. Fahr., the weight of which is called the kilogramme, and is two and two-tenths of our pounds ; but really the standard unit of weight is the platinum kilrogramme-weight deposited in Paris.

"In Germany you never hear of the kilo, but they sell by the pound, their pound being the half of one kilo ; this they cut up as they please into smaller weights, and you can buy half a pound of grapes or butter just as well as you can in America. It is claimed that given the metre, all weights, etc., can be deduced from it; in theory this is very well. The most skilled workmen, however, are not yet able to make two litres of water weigh alike to the utmost point of accuracy, and the cubical litre is not used, but is converted into a circular or cylindrical vessel, with all the trouble of the problem of squaring the circle.

"If a bar of ordinary forged iron be planed up to measure one inch square, and the bar be one English yard long, it will weigh ten pounds, and the tenth of such a bar will weigh one pound more accurately than will the ordinary litre of water weigh one kilo. The English engineer in these days of iron knows when he uses shapes of iron rolled of uniform section, that the tenth of their weight in pounds per yard gives him the area of the section, and this one admirable incident will long fix the desirability of the present unit of England and America.

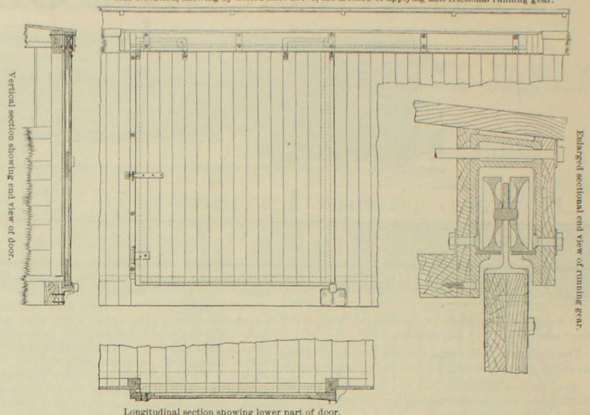
"When we consider the interest involved it will be seen that the population now making practical use of the English standard is greatly in excess of that using, by force, the French system. Millions of those numbered among the people who use the French system have no occasion to use any or know any system whatever save in the crudest form.

"Swedish iron and steel are rolled to English inches in size; so, also, their boards are cut to the English inch, because their market is largely in those countries that use the inch. In the Russian machine shops the English inch is used exclusively, and, as I have said, throughout all Germany it holds for all screw sizes. In France and in Belgium the yard stick is the metre hung from a rod like the cross bracket of a drop gas-light, placed about 18 inches above the counter. In Germany the half metre, or 20 inches, about, is the measure used, and that held in the hand of a salesman by a handle at one end of the measuring stick. The Swedish machinist carries in his pocket a rule on which he has the English inch, and by its side the French measures ; on the other side he has the two Swedish feet, one long in use, and one ordered to be used but never put into practice. The Swedish roads are laid out now in kilometres, and marked by iron plates, giving at each ten kilometres the distance from some place, while half-way between is a sign 5 kl. This division of the roadway seems to them to be fine enough, as the old Swedish mile was six and two-thirds of our mile, and five kilometres is a less distance."

"Carefully as I have considered this subject of weights and measures during the time I have been from home, I am the more confirmed in my opposition to the enforced adoption of the metric system of France in my own country, and firmly believe that those countries that have adopted it are at a disadvantage as compared to even the most imperfect of our systems. America has entered on the line of simplification of its metrology, and that is the direction that should be followed—not by any means giving up what is good, but by making what has been found to be practical better and simpler.

"One has not to be long in England to find out how firmly are the seemingly complicated systems of weights and measures of that country fixed with the people. They weigh by the stone, and compute by the sterling currency as rapidly or more so than we do with our dollars and cents, and that because their unit is larger. The English shopkeeper knows nothing about decimals, and says, if you ask him, that he has never learned what they are. England has lately made legal the admirable standard manufactured by Sir Joseph Whitworth, and the chance of her adopting the metric system is not in the most remote degree possible."

Side elevation, showing by dotted lines above, the method of applying anti-frictional running gear.



Vertical section showing end view of door.

Enlarged sectional end view of running gear.

Longitudinal section showing lower part of door.

PRATT'S FREIGHT CAR DOOR.

The peculiarity in the construction of this door is shown in the cuts. The diameter of that portion of the traveling wheels from which it is suspended is ½ inch, while the diameter of the entire wheel is 3 inches, the frictional circumference upon which the weight is carried being 1.570 inches, the door at the same time traveling a distance of 9.424 inches at each revolution of the wheels, thus reducing the friction to a minimum, lessening the cost of repairs and renewals and loss of doors.

These doors are in use on the new line cars of several New England roads, and have been subject to practical test for the past four years. No special tools are required to make them, and the materials are at hand in every car shop.

Roadmasters' Association of America.

At the recent meeting of the Association in Indianapolis, Mr. Charles Latimer, Chief Engineer of the New York, Pennsylvania & Ohio road, delivered an address on

MAINTENANCE OF WAY,

in which he enumerated the following vital things in this branch of railway service :

"First : We must have a good solid foundation for our road, otherwise we cannot keep it up.

"Second : We must have it well settled, with a good base, or our ballast will not stay upon it.

"Next, we must have good, strong, well-seasoned oak ties of proper proportion upon which to lay our track.

"Next, we must have a steel rail of proper weight, proportion and quality; a good spike well tested, of proper shape, size, weight and material, and then a joint with which the rail must be fastened.

"Then they must be carefully laid and ballasted. If the road-bed ballast, ties, rails, spikes and joints are perfect, but, the road-bed is poorly ditched, the ties improperly spaced, the spiking badly done, the rails laid without regard to expansion, the gauging erroneously done, and the track not shimmed as the rails are laid ; we find that, while partially correct, we have failed in vital things.

"If the frogs and switches are properly selected, but laid with wrong leads and curves, accidents will ensue, and we have again failed in vital things.

"If the rails are too light for the traffic, or of inferior material and quality and improperly drilled, with misfit splices, bolts too short and frogs and switches of wrong size and pattern, another class of vital points have been neglected.

"I know of a road where, on account of an accident at a split switch, the manager decided that every one should be at once removed upon the long line of road and another kind introduced, which was done, but the law of the survival of the fittest came in, and after four years the split switch was restored, at an immense cost, of course.

"And, again, an accident at a spring frog caused a manager, afraid of his sole decision, and without proper consideration, to abandon all spring frogs and substitute rigid frogs at immense cost.

"This raises two questions: First, What is the best switch? Second, What is the best frog? This depends, not only on the best kind or pattern, but on the best construction of that pattern. After the most careful examination and experience of years, I say that a spring rail frog, *well made*, is safer and four times as economical, at the least, as any frog known. I also claim that a split switch, *properly made*, is the cheapest, safest and most durable of all switches. These are vital things involving questions of economy and safety, but they are as yet unsettled in the minds of many.

"Many lives have been lost by switchmen and others getting their feet caught in guard rails, switches, frogs, etc. How shall we prevent this loss of life? Several years ago we tried cinder and wood, and, after long thought upon the matter *pro* and *con*, I know nothing better than wood. This question should never be lost sight of until the perfect remedy is found.

"But what are the vital, material things to those things which underlie, and surround, and crown the whole? What can we do without strong muscular arms, good physique, good health, good common sense and heart devoted to the work we have in hand? We all agree in this, and yet to-day the roads are pursuing a course which is dwarfing the race, weakening it body and soul. Outside of any question of religion, that race will be stronger and more intelligent which obeys the law of God. Instead of this we work seven days in the week, and in every day more hours than is proper. Can the future generations of the country be as strong as they should be under such circumstances? In the running of trains throughout the country no regard is paid to the Lord's day upon railroads, and railroad employés have lapsed into a sort of Egyptian bondage and they dare not, or, because they reap profit from it, they cannot, speak against this evil. And so here and there families on these Sundays are without the care of their fathers. Certainly the children of railroad men worked thus must be dwarfed. In addition to this, the law broken leads to intemperance, and thus Sabbath breaking and intemperance go hand in hand by authority and to break down everything held dear by our forefathers and all that distinguishes us above other nations. Many of you will wait for a Sunday to put in a crossing ; this is entirely unnecessary and wrong. Get everything ready at the point of repair, and at the opportune time on a week day, hurry matters, and the job will be done just as well and better, and there will be no Sabbath breaking to account for. The greatest evils I see to-day on railroads, and the most vital things to correct, are Sabbath breaking and intemperance.

"But humanity is a more vital thing than all. What can any railroad company expect which treats its employés like machines ? Let me have the hearts of my men with me and let my competitors care nothing for their hearts and only what their brawny arm can do by an uninterested service, and I will carry the majority of freight and passengers and have a better road on less money."

FOOT GUARDS FOR FROGS AND SWITCHES.

Mr. Doyle had put in Hart's foot guards on his road two years ago. The total cost for equipping a frog was $1.75.

Mr. C. E. Jones (Chicago, Burlington & Quincy) makes a guard sawed out of oak planking and has had no trouble with them. Cost is very small.

Mr. Merrill fills the frog up with cinders for his foot guards.

Mr. Adamson has adopted a guard made out of a plank 2 or 2½ in. thick. Car shop scraps are very well suited for this purpose and as they are in great plenty the cost is necessarily light. Fits the scraps to the different angles.

Mr. Preston put the Hart guard on his road about three years ago and has his entire main line equipped with them. Costs about $1.85 for a single switch, that is, one frog and guard rail, including material and labor. For a three-rail switch, three frogs, guard rails, etc., cost about $3. This is the best and cheapest blocking in use. Two-inch pine planking does not make as good a guard as Hart's.

Mr. Coleman fitted 3-in. planking to the frogs, guard rails, etc. Cinders are unsatisfactory. Was in favor of the Hart block.

President Burnett: The Hart guard is the best thing.

Mr. Latimer uses cinders and blocks. Had put in a steel spring, an invention of Huntington's, but it was condemned by his road-masters. Castings are too expensive. A cheap wood was what was wanted, as frequent renewals were necessary. There was great danger, he thought, in filling up all the frogs on the line, as derailment was possible when filled up with snow and ice.

Mr. Doyle: The rail should not be entirely filled. He only did so to the guard rail.

Mr. Jones: We use a considerable quantity of salt on frogs, and have no trouble from snow and ice.

Mr. J. H. McDonald (Chicago & Northwestern) has used guards for two years and cannot be suited. He now uses sheet iron made to fit the lower edge of the ball of the rail and then made concave between the rails. This is not solid, but gives way under wheel pressure. Something was needed that could not be destroyed by the section men's picks.

Mr. Doyle, summing up all the arguments, thought that the Hart guard should receive the indorsement of the Association until something better was found.

Mr. McQuiston, Mr. Galarneau and Mr. Preston were appointed a committee to report on this subject at the next meeting.

RAILS AND WHEELS.

The two remaining subjects, namely, "The effect of unevenly gauged wheels and worn wheels upon the rails, frogs and switches," and "The best form and weight of rails for present rolling stock," were discussed jointly.

President Burnett thought that improvements in rails had not been kept up with those in weight of locomotives and cars and speed of trains. To one getting down and looking along a line of our common steel rails they show the effects of our heavy traffic like ripples on the water. A half inch added to 4½ in. rail would increase its weight but little, but would add several years to its life. Hardly anything is worse for the road-master than worn wheels. Switch engines should have the best wheels, but they have the worst. One in Joliet broke four frogs in one night. Car wheels vary from 4 ft. 4½ in. to 4 ft. 5¾ in. Something must give way with such wheels. When the train goes off the blame is laid to the frog, of course, when in fact, it is blameless. There should be 70 lbs. rails everywhere, and the wheels should not vary over ½ in. in gauge. Line cars make the most trouble in the matter of gauge.

Mr. McQuiston favored the 4½ in. Edgar Thomson or Pennsylvania pattern of 67 lbs., as the most economical for a 45-ton engine. The gauge must be widened on curves as the engine frame cannot bend. Uniformity is very desirable, but there are different opinions about many things. These meetings help us to get light and approach uniformity.

Mr. Buhrer had found broken car wheels caused by rails with narrow heads 1½ in. wide.

Mr. Craig thought that the increase of play of worn wheels caused more trouble than gauge.

Mr. McDonald said that a 70-lb. rail would save at least 10 per cent. in section labor as compared with a 60-lb. On half a mile of that weight he had not found it necessary to spend $25 in four years. Such rails hold up joints without giving. Road-masters are generally too timid about complaining of wheels that injure their tracks, for fear of seeming to interfere with the master mechanic.

Mr. Lovell had found the web rather too light in their 67-lb. rail. Now uses a 69-lb. with the added weight in the web. This is satisfactory. His company keeps a perfect record of wheels and allows none in service beyond the term of their life. Then they are broken up and recast. Axles are treated in a corresponding manner.

It was voted that a rail weighing from 65 to 70 lbs. to the yard and 4½ in. high should be considered the standard.

Mr. Reed: Different roads have different kinds of traffic, ballast, spacing of ties, etc., all of which should be considered.

Western Railway Club.

At the regular monthly meeting of the club held in Chicago Oct. 15, the subject of

LOCOMOTIVE TIRES

was again taken up. The following is a summary of the discussion:

The Secretary read a communication from Mr. G. W. Stevens, stating that 247 worn-out tires were removed by the Lake Shore & Michigan Southern during the year 1883. Average miles run per $\frac{1}{16}$ in. wear, 8,977; the measurement of wear being taken at ¼ diameter of tire.

In many cases class of steel was not known.

Mr. Mackenzie: We have two different kinds of tires, and I undertake to show the difference in wear of the tire between the first and second turnings or between the second and third. Engine 202, Class A (switching), has had her tires turned twice. Original thickness of tire, 3 in.; thickness after first turning, $2\frac{13}{16}$ in.; number of miles run before first turning, 31,647; miles run per $\frac{1}{16}$ in. wear, 4,220; second turning, from $2\frac{13}{16}$ to 2 in.; miles made between turnings, 33,580; miles per $\frac{1}{16}$ in. wear, 3,950; total mileage up to last turning, 65,227 miles. The mileage between the two turnings was nearly the same. In another case, of an engine in freight service, the mileage per $\frac{1}{16}$ in. wear before the first turning, was 4,440, the mileage before the first turning being 34,303 miles; the mileage per $\frac{1}{16}$ in. wear between the first and second turnings, was 6,860; the total mileage was 78,708 miles. All our freight engines make a greater mileage after the first turning than they do before, while with the switch engines it is the reverse. Both of these turnings were made after about the same time—about a year between the turnings. The tires generally were round, without flat spots.

Mr. Prescott (Texas & St. Louis): How did you obtain the mileage of your switch engines?

Mr. Mackenzie: We allow six miles an hour. The traffic was about the same at all times of the day.

Mr. Prescott: Sometimes engines lie around and do nothing, and in other seasons they work 24 hours a day, and it is the same way with engines on local freight trains switching; at some seasons of the year, where the freight is very heavy they are worked a great deal more than at others. Your mileage may be very low on the local freight. On our Northern road they are now taking in wheat at every station, while at some seasons of the year they have very little to do.

Mr. Mackenzie: Of course you cannot get the exact mileage; it is difficult to get the mileage even of a through freight.

Mr. Prescott: We can never arrive at exact knowledge until we put a device on engines to register the mileage actually made with a tire.

Mr. Allen Cook (Chicago & Eastern Illinois): What is the experience of members who use tires thicker than 3 in.? Is it profitable? How did the metal act after 1½ in. or 2 in. of the metal was worn off? Were the wearing properties as good?

Mr. Mackenzie: A 3-in. tire is better than any other thickness.

Mr. Cook: If we were sure of getting a good solid metal 3 or 4 in. thick, it would save putting on tires so often. Has any one worn out one of those thick tires, and were good results got from the centre of it?

Mr. Mackenzie: A record of turnings will show which is the best. I prefer cast to wrought iron shoes on driver brakes.

Mr. W. H. Lewis (Delaware, Lackawanna & Western): Recently I removed a 42-in. coach tire worn $\frac{5}{16}$ in. from the wrought-iron combination shoe. The tire was not worn where it bore on the rail.

Mr. Mackenzie: In connection with the wrought-iron shoe, have any members found any difference in the size of their drivers? In one we found ¾ in. difference between the back pair of wheels and the middle pair. What was the cause?

Mr. Cook: Has any one taken out steel-tired wheels from under coaches for anything but sharp flanges?

Mr. Pullman: I do not remember ever taking out a pair of wheels that were worn straight down on the rail.

Mr. Cook: That has been my experience. I do not have to take them out to turn them because they are worn, both wheels alike, but because they have run on one side and have got a sharp flange, or are going to get a sharp flange.

Mr. Townsend: I have had to take steel-tired wheels out when the flange was good, because they were worn hollow in the center.

Mr. Prescott: All of ours require turning, because of a sharp flange on one side.

Mr. Cook: How much can you turn off from the flange?

Mr. Reynolds: Our limit is 1 in.

Mr. Cook: We turned off a set from under a Mogul engine; the wheels all looked well, but one day 9 in. of flange came out, and we found it was all honeycombed. We had turned down almost to it. We turn our cars, and our curves are about evenly divided.

Mr. Prescott: If locomotive tires will run true, a car-wheel should do the same if properly turned up both of a size and the truck is square. A car-wheel should run just as well as a locomotive tire.

Mr. Cook: Cars have not so much to steer them as a locomotive; a locomotive is accurately made and watched closely, while coaches are switched and slid along, and run in dust and grit, which tends to cut the flanges and wear the wheels more than on a locomotive.

Mr. Pullman: I never found two steel-tired wheels worn alike, or of the same size when they were taken out; I do not know any way to find out why a wheel is wearing partly on one side and partly on the other.

Mr. Townsend: Why is it that some tires have a soft place in them, or hard spots, while between it is perfectly soft and becomes flat, so that the wheel does not wear round, and it is almost impossible to turn it? Some wheels will take two days to turn, while an ordinary pair of wheels can be turned in four or five hours. Such wheels do not give as much wear as those that are not so hard. How do Washburne wheels wear, and what satisfaction do they give?

Mr. Cook: Washburne wheels are doing very well under tenders and under the front of Mogul engines. They did not do so well where the flange is cut in the fillet and the wheel has had a considerable amount turned off. We then get into honeycombs; but when we first start and after one turning we get good results. They made good mileage, wore round, uniform, and did what we call good service.

Mr. Townsend: We have about 500 of them, but have never had one honeycombed yet. They have given excellent mileage, and their flanges have worn better than the ordinary steel-tired wheel.

Mr. Cook: None have worn so on cars, but we do find them on locomotives.

Mr. Townsend: Most of ours have been taken out for a sharp flange, showing that one tire has been softer and wore away faster than the other or they may not have been both the same size.

Mr. Cook: They are accurate when turned out.

The discussion was then closed and the meeting adjourned.

Fast Locomotives and Track Gauge.

In a paper on Modern Locomotive Practice read by H. Michell Whitley, before the Civil and Mechanical Engineers' Society of England, the author concludes his address by drawing attention to what may possibly be one course of locomotive development in future, as follows:

"Time is money, and it may be in the coming years that a demand will arise for faster means of transit than that which we possess at present. How can we meet it? With our railways laid out with the curves and gradients existing, and with our national gauge, and our present type of locomotive, no great advance in speed is very probable; the mean speed of express trains is about fifty miles an hour, and to take an average train of 200 tons weight at this speed over a level line requires between 650 and 700 effective horse-power, within the compass of the best engines of the present day. But if instead of 50 miles an hour, 70 is required, an entirely different state of things obtains. Taking a train of 100 tons, with engine and tender weighing 75 tons, or 175 tons gross, the first question to determine will be the train resistance, and with reference to this we much want careful experiments on the subject, like those which Sir Daniel Gooch made in 1848, on the Bristol & Exeter Railway, which are even now the standard authority; the general use of oil axle-boxes and long bogie coaches, irrespective of other improvements, would render this course desirable. With regard to the former, they appear to run with less friction, but are heavier to start, oil boxes in some experiments made on the Southwestern Railway giving a resistance of 2.5 lb. per ton, while grease boxes ranged from 6 lbs. to 9 lbs. per ton. Again, the long and heavy bogie Pullman and other coaches have the reputation among drivers, rightly or wrongly, of being hard to pull. The resistance of an express train on the Great Western Railway at 75 miles an hour was 42 lbs. per ton, and taking 40 lbs, per ton for 70 miles an hour, would give a total resistance on the level of 7,000 lbs., corresponding to 1,400 horse-power—about double the average duty of an express engine of the present day. The weight on the driving wheels required would be 18¾ tons, allowing one-sixth for adhesion, about the same as that on the driving axle of the Bristol & Exeter old bogie engines. Allowing 2½ lbs. of coal per horse-power per hour would give a total combustion of 3,500 lbs. per hour, and to burn this, even at the maximum economic rate of 85 lbs. per square foot of grate per hour, would require a grate area of 41 square feet, and about 2,800 square feet of heating surface. Unless a most exceptional construction combined with small wheels is adopted, it appears almost impossible to get this amount on the ordinary gauge. It is true the Wootten locomotives on the Philadelphia & Reading railway have fire-boxes with a grate area of as much as 76 square feet, but these boxes extend clean over the wheels, and the heating surface in the tubes is only 982 square feet; but although these engines run at a speed of 42 miles an hour, they are hardly the type to be adopted for such a service as is being considered. On the broad gauge, however, such an engine could easily be designed on the lines now recognized as being essential for express engines without introducing any exceptional construction, and there appears but little doubt that were Brunel's magnificent gauge (7 feet) the national one, competition would have introduced a higher rate of speed between London and our great towns than that which obtains at present.

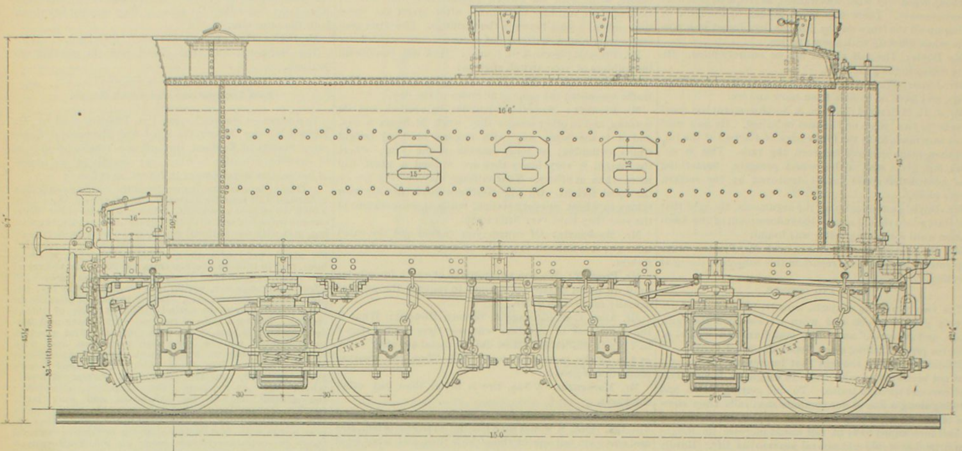
"The whole question of the future introduction of trunk lines, exclusively for fast passenger traffic, is fraught with the highest interest, but it would be foreign to the subject matter of this paper to enter more fully on it, the author merely desiring to state his opinion that if the future trade and wealth of our country require their construction, and if a very high rate of speed much above our present is to be attained, their gauge will have to be seriously considered and settled, not by the reasons which caused the adoption of the present gauge, but by the power required to carry on the traffic—in fact, to adapt the rail to the engine, and not, as at present, the engine to the rail. High speed requires great power, and great power can only be obtained by ample fire-grate area, which for a steady-running engine means a broad gauge. The Gauge Commissioners of 1846, in their report, esteemed the importance of the highest speed on express trains for the accommodation of a comparatively small number of persons, however desirable that may be to them, as of far less moment than affording increased convenience to the general commercial traffic of the country. The commercial traffic of England has grown and prospered under our present system, and if its ever increasing importance demands high speed passenger lines, we may rest assured that the ingenuity of man, to which it is impossible to assign limits, will satisfactorily solve the problem."

THE manufacture of electric head-lights for locomotives has begun at Akron, O., by the American Locomotive Head-Light Company, of which Lewis Miller, of Akron, is president, and Mr. Lynn, formerly of Indianapolis, is acting superintendent.

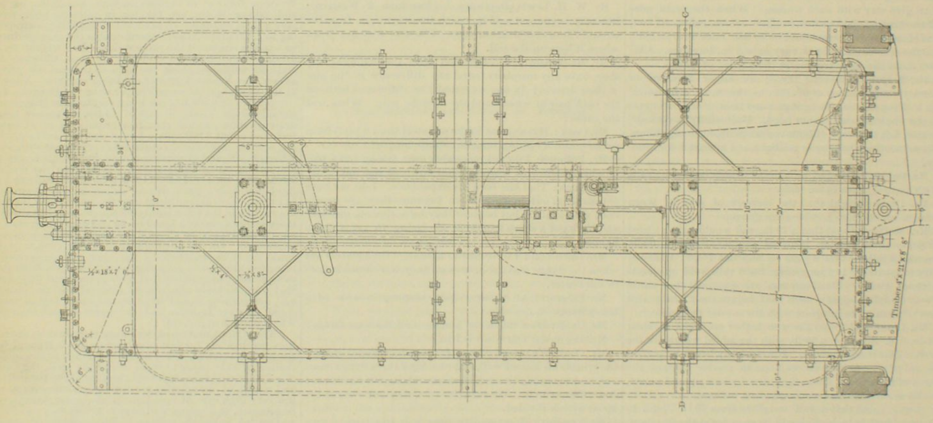
THE effeminate man is a weak poultice. He is a cross between root-beer and gingerpop, with the cork left out. He is a teacupful of syllabub; a kitten in pantalettes; a sick monkey with a blonde mustache; a paper kite in a dead calm. He lives like a butterfly—nobody can tell why. He is as harmless as a cent's worth of spruce gum, and as useless as a shirt-button without a hole. He is as lazy as a bread pill, has no more hope than a last year's grasshopper, and dies like cologne-water spilt on the ground.

STANDARD MOGUL LOCOMOTIVE TENDER WITH CHANNEL IRON FRAME.

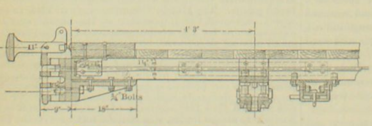
Cleveland, Columbus, Cincinnati & Indianapolis Railway.



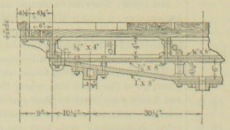
Side Elevation.



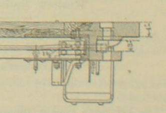
Plan.



Center Longitudinal Section.



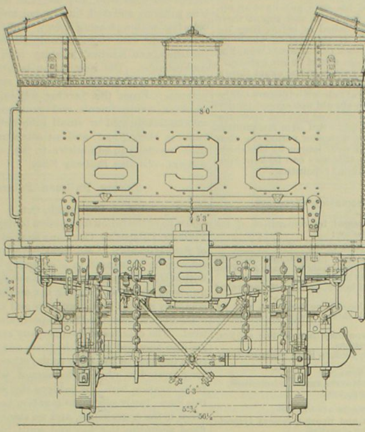
Transverse Section C D.



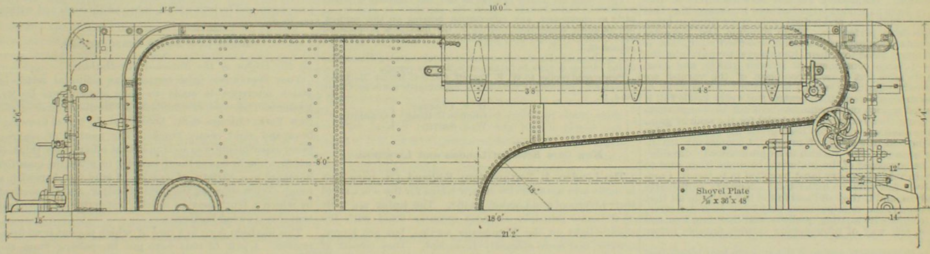
Center Longitudinal Section.

The drawings illustrate the standard Mogul locomotive tender of the Cleveland, Columbus, Cincinnati & Indianapolis Railway. The frame is of channel iron, and with the exception of the flooring, the tender is of iron throughout. The channel iron is 6 in. deep, with a ⅜ in. web and flanges extending 1⅞ in. from the web. The beam then measures 6 in, high by 2¼ in. wide. It weighs 20.4 lbs. per running foot; 87 ft. in all are used in making a total weight of 1,774.8 lbs. There are two pieces 25 ft. long and two pieces 18 ft. 6 in. in length. The two shorter pieces form the center sills, while the others are bent, making the end and side sills continuous. The greater portion of the holes in the flanges are 11/16, though there are a few for special purposes which are larger. Stiffness is secured in this frame, not by heavy corner or center castings, but by iron plates, which go directly upon the end of the frame and are riveted through the flanges. These plates are ½ in. thick, 18 in. wide at the centre sills and 7 ft. long, extending the whole width of the frame. Their form is shown in the plan. At the back end a top plate is added, which is a ½ in. thick and 18 in. wide for its whole length. All the other plates are tapered at the outer ends to 6 in. wide, forming angle sheets connecting the corners with the center sills. This plan gives stiffness with a minimum cost, and has the further advantage that in case of any bending of the parts, they can be easily separated by cutting the rivets and the whole brought back to shape with comparative ease. However, with such an amount of strength in the corners, a serious blow would be required to do any great amount of damage or bend the sills.

The front end of the tender has a buffer beam 4 in. thick 21 in. wide and 8 ft. 8 in. long, which forms a continuation of the double floor which is laid on top of the iron frame. This floor consists of two courses of 2-inch plank, laid at right angles and held fast by bolts going through the brackets. In addition to the stiffness thus obtained for the frame, double stays riveted in the centre are put in over each of the transoms and in the centre, in the form of cross plates ½ in. thick by 6 in. wide, which connect



Back End Elevation.



Half Plan.

the side and center sills. There is also a plate bolted upon the under side of the sills and going all the way across, which is 8 in. wide, by ½ in. thick. Inside the center sills are a pair of 1¼ in. rods 19 ft. 4 in. long, with 1⅜ in. ends. These pass through the draw castings at both ends and are secured by lock nuts. The iron transom is shown in section and is very heavy. A ⅞ in. casting between the center sills is introduced to secure additional strength and stiffness. The trucks are of the Thielsen pattern, with outside brakes hung from the body of the tender, and spiral springs on the bolster. The arch-bars are 1½ by 3 in. The wheels are 33 in. in diameter, and spread 5 ft. from center to center. The trucks are 10-ft. centers, with a total wheel base of 15 ft. The tender is 21 ft. 2 in. over all. The tank itself is 16 ft. 6 in. long. The height to the top of the collar is 8 ft. 7 in., and the width of the tank 8 ft. It holds 3,000 gallons of water and 5 tons of coal. The weight on the forward truck, and the truck itself, is 31,630 lbs., and the weight on the back truck 30,000 lbs. The total weight of tender, with all the appliances, is 61,630 lbs.

Although there is much prejudice against the use of iron tender frames, yet this prejudice undoubtedly comes from local circumstances. Where a road is in an iron country, well provided in its repair shop with men who are familiar with cutting up and repairing iron structures, it is considered a very desirable material and more economical than wood. On the other hand, if wood be plenty, iron workers scarce, and the appliances for handling and straightening insufficient, the iron tank becomes a sort of white elephant. It is therefore not to be wondered at that while some master mechanics and superintendents are enthusiastically in favor of iron frames for their tenders, others condemn them with quite as much heartiness, and replace any they may have with wood as soon as possible.

Pneumatic Street Railways.

There has just been completed at the Risdon Iron Works, San Francisco, an experimental car to be run by compressed air by a new system, a trial of which was made recently. In the new plan there is a storage and charging pipe which carries the air below the surface of the road-bed all along the route, contiguous of the track. Through a system of valves attached to this pipe, closely set together within the track, the pipe may be tapped and the receivers replenished at any and all points on the route. In this way the system is so arranged that the car is never removed from its source of supply, and has no determined distance to travel with each charge, so that it may have a minimum capacity as to storage room and pressure of air instead of the maximun, as when the length of the journey to the charge is absolute and fixed.

Compressed air motors have been run a definite distance without replenishing, as from end to end of a route and back, and suggestions have been made to run from station to station, using a pipe connection between, but in all cases provision has had to be made for carrying the heaviest possible load of passengers under the most adverse circumstances likely to occur, such as those arising from very frequent stoppages, bad condition of the track, accidental delays, etc. The definite points could not be passed without refilling the receivers, and either the engineer had to go or the motor itself had to be taken to the station off from the main line in the act of refilling, this system of operation leading to all the difficulties which have heretofore surrounded the use of compressed air as a motive power for street roads. No practical system has been put in use so far by which the motor could be resupplied with air at any and all points on the route.

The motor which has just been tried is constructed as an open car, after the style of the cable road dummies, and the air receivers are placed under the seats. From these receivers, which are connected by a pipe, a hose connection is made which terminates in a metal nozzle, in the end of which is fitted a valve to make connection with the service pipe, as described hereafter.

The main service pipe is placed underground, near the track, and is large enough to have in itself storage capacity sufficient to insure that the drawing off of each charge for the motors will not greatly decrease the pressure. It is thought that a pipe of five or six inches diameter will do for roads running cars five minutes apart; while it should never be less than four inches in diameter.

This main pipe is provided with right-angled branches, say every 300 feet more or less, which lead to the center of the track and terminate in valvular outlets. The nozzle connected with the reservoir on the cars fits into this valvular outlet, so that air comes from the main pipe into the reservoirs when wanted. The valvular connection is peculiar and the action is automatic. When the nozzle is put in, the air can flow; when withdrawn, the valve in the outlet closes. This is an important feature, and the details are quite ingenious. Of course other devices than this may be used, but a practical trial has demonstrated the utility of the plan adopted. It may be desirable, too, to place reservoirs at the outlets so a great volume of air may be immediately at hand to draw from, and a quick operation in replenishing the receivers effected. Air compressors may be placed at one end of the line only, or at both ends, as circumstances dictate. The air engines connect in the ordinary manner with the driving wheels on the cars.

The system of operating is as follows: The storage and supply pipe being filled with air, say at a pressure of 100 pounds per inch, the motor's receivers are filled therefrom at the depot at full pressure. On starting out as it proceeds on its trip, the air is used on the motors either at full pressure direct from the receivers or reduced to say 30 pounds by passing it through reducing valves. When the conductor strikes the bell for a passenger to get on or off, the engineer stops at just where the next valve of the supply pipe is located or within a few feet thereof. These valves are placed at street crossings generally. The engineer then takes down his feeding nozzle and inserts it into the hole in the street, and connects. The air rushes through the nozzle and fills the reservoirs until the bell sounds to start, when the nozzle is taken up and replaced on its stand. The engineer need not wait to get the first few pounds of pressure, but may start with such pressure as he has obtained. In this way no unnecessary delay occurs.

The car or motor need not be required to travel over six or eight blocks, or even a less distance, where stops are frequent. The valves may be placed at crossings or even every hundred feet if necessary. It is desirable to be able to refill the receiver at every stop, to have great pressure when starting. Several suggestions have been made to operate street railroads with compressed air carried near the track, but none have included within their scope the system here proposed, which is the invention of Mr. George Pardy of this city. In this system the maximum weight of the load and contingencies of the trip do not control, but have only the effect of limiting the distance the motor will be capable of traveling without having recourse to the supply pipe, constantly at hand. In fact, those stoppages which are of necessity caused by taking or leaving passengers are the only ones necessary to make, it being calculated that these will be ample in most cases to give the required opportunity to replenish the receiver.

In running on this system they get over the great loss of power required to move a cable. On the cable roads 68 per cent. of the power is necessary to drive cable alone without counting cars or passengers. Then again it is different from steam dummies or locomotives in this: there is only one central fire for the compressing machinery, instead of separate fires, boilers, etc., for each machine. They expect to utilize 50 per cent. of the useful effect of the compressed air. One engine supplies all the cars. These cars are expected to go up a grade of one in fifteen. The experimental trial of the system already made proved very satisfactory to the promotors. The car ran with 100 pounds pressure for three-quarters of a mile one trip, and seven-eighths of a mile the second trip. The car weighed about 3½ tons and the passengers 2¼ tons. The highest speed attained was 16 miles per hour, and the car went up a grade of one in thirty-seven at 8 miles per hour. The connecting valve worked satisfactorily.—*San Francisco Min. and Sci. Press.*

The Varnishing of Passenger Cars.

[Paper read by D. D. Robertson, of the Michigan Central Railway, at the last meeting of the Master Car Painters' Association, on "The Best Method of Testing Varnishes to Secure the Most Satisfactory Results as to their Durability, with Practical Suggestions as to the Time a Car May Safely Remain in Service Before Being Taken in for Revarnishing."]

The subject which the Association has assigned to me for this convention has always been regarded as important. There is no branch of the business which gives the painter more anxiety than the varnishing department. It is more susceptible to an endless variety of difficulties and therefore needs more close and careful attention than all other branches put together, and even with all the research and practical experience which has been given to the subject, we are yet far from coming to a definite conclusion as to the causes of many of the unfavorable results.

Beauty and durability is what we aim at in the paint shop, and from my experience in varnish work, we may have beauty without durability, but we have rarely durability without beauty, so that the fewer defects of any kind in our work, caused by inferior material, inferior workmanship or any other cause, it is more likely to be durable, and ought therefore to possess beauty. There are certain qualities absolutely necessary to durability in varnish. The materials of which it is made must be of the proper kind, pure and unadulterated, the manipulation in manufacturing must be correct as to time, quantities, temperature, handling, etc., and age is also necessary. The want of durability arising from the quality of the materials, or from the manner of manufacturing, the painter has no control over; but let me say here that frequently a first-class varnish has been used upon a car, and after being in service for a short time it deadens, checks, cracks, chips, or flakes, and therefore shows a very poor record. The varnish is condemned, when in reality had the varnish been applied under different circumstances and over different work, the result would have been good and the durability satisfactory. I am satisfied that in many cases first-class varnish has to bear the odium, when the root of the evil is to be found nearer the foundation. The leading varnish manufacturers of this country have expended large fortunes to secure the best skill and appliances, and indeed to do every thing to bring their goods to perfection. Their standing and respectability puts them beyond suspicion, and their reputation is of too much value for them knowingly to put into the hands of large consumers an inferior article, and even when we have just cause to complain of the varnish we ought to be charitable enough to attribute the mistake to circumstances beyond their control (for every kettle full is subjected to such circumstances), and not to charge them with using cheap or inferior material for the sake of gain.

If the question which has been given me means to give some method of testing before using, I confess my inability to answer. For varnish to be pronounced "durable" must be composed of the materials to make it so, and to ascertain this, chemistry must be called in to test it. Comparatively few painters understand chemistry sufficiently to analyze, and if they did and found the material all that is necessary, the manipulation may have been defective, so as to injure its wearing qualities, and therefore I cannot suggest any way of pronouncing varnish durable before using it.

As to the common custom of hanging out boards prepared and varnished, to the exposure of the sun and weather for months, does not seem to me to be the correct way of testing durability. It is true we may by this mode get some idea of wearing properties, but the most thorough and correct way is to put the varnish to the same exposure, the tear and wear that it would have in the regular service on the road on which it is to run. Cars while running are exposed to circumstances which boards on the wall are not subjected to. The cars under my charge run through two different countries and three different States, and are therefore subjected to such a variety of climate and soil that the testing by stationary boards would completely fail to give the correct result. For example: I have placed two sample boards, prepared and varnished, and exposed them to all kinds of weather and to the constant and steady rays of the sun for an equal length of time, and both gave favorable results; and I have also put the same varnishes on a car and found very different results. One of the varnishes having some properties better adapted to resist the friction caused by cinders, sand and dust, and consequently not so liable to cut the surface, and therefore much more durable.

The system which I adopted long ago, and to which I still adhere (not on account of "old fogyism," but for want of better), is as follows: I have two varnishes which I want to put into competition to test their relative merits. With varnish No. 1 I do the south half of the east end of the car and the east half of the south side of the car, the north half of the west end, and also the west end of the north side; this is also done with the same varnish. On the other half of the car varnish No. 2 is put.

Thus you will see it is so placed that should the car be turned at any time, both varnishes on each side will have the same exposure and circumstances to contend with. This I regard as the best method to test the durability of varnish. And again let me say that it would be wrong for me to argue that because the varnish which I use gives me the best results, therefore I would regard it the best for all to use. This would be wrong, inasmuch as we have a diversity of climates between Maine and California, and between the extreme northern and southern States. The varnish which has failed to give me satisfaction may be most suitable for other parts of the country.

As to the second part of my subject, "What length of time may a car safely remain in service before being taken in for revarnishing?" This must be regulated by the nature of the run and the general treatment of the car while in service. Through cars are frequently continuously on the road and little or no opportunity can be had to attend to them while in service. Such cars should be called in earlier than those which make shorter runs, and where ample time is allowed at both ends of the journey to be kept in order. And again, cars which are run nearest the engine cannot make so large a running record as those less exposed. Some roads—for a variety of reasons which might be given—can run cars for fourteen months with less wear than others can run twelve months. So that I hold that the master painter on every road should keep a complete and correct record of his cars, and have an opportunity to examine these at intervals and report their condition in order to have them called in before they are too far gone for revarnishing. If this system was more frequently adopted the rolling stock of our roads would be more attractive and the companies would be the gainers.

I cannot lay down a standard rule as to the exact time a car should remain in service before being called in for revarnishing, but I find as a general rule with the cars on the Michigan Central road, that they should not exceed twelve months' service, and new cars, or those painted from the foundation, should not be allowed to run over ten months the first year. By thus allowing a shorter period the first year the car will look better and wear longer by this mode of treatment. Cars treated in this way can be kept running for six and seven years without repainting.

Master Mechanics' Association Circulars.

Circulars of inquiry have been issued by committees of the Master Mechanics' Association as below:

HYDRAULIC BOILER TESTS.

1. Is the frequent testing of boilers by hydraulic pressure desirable? If so, how often should these tests be made? What excess over working pressure should be applied, and why?
2. Do you recommend other tests in connection with hydraulic? If so, what other tests, and why?
3. Do you consider the test of a locomotive boiler at rest by hydraulic pressure, conclusive to its safety under all conditions of service?
4. Please give any information you may have on this subject, not called for in the foregoing questions.

Replies to be sent before April 1, 1885, to H. N. Sprague, Pittsburgh, Pa.

H. N. Sprague,
W. L. Hoffecker, } Committee.
D. O. Shaver,

SMOKE-STACKS AND SPARK ARRESTERS.

The Committee on Smoke-stacks and Spark-arresters respectfully request replies to the following questions:

1. What form of smoke-stacks do you use in connection with the ordinary smoke-arch? Please give dimensions and results obtained.
2. Are you using any form of spark-arrester or extension front ends? If so, state how constructed and results obtained.
3. What has been your experience with the fire-brick arch or other device in the fire-box in connection with the extension front as compared with the ordinary smoke-arch?

The Committee desires to make as full and complete a report as possible, and earnestly requests the members to give us, as early as convenient, any information bearing on this subject, not confining themselves entirely to the questions propounded above, but giving any information obtainable in addition to that requested.

It is also desirable that drawings or sketches giving dimensions of the various devices be furnished with your report.

Please send replies to W. F. Turreff, General Master Mechanic Cleveland, Columbus, Cincinnati & Indianapolis Railway, Cleveland, O.

W. F. Turreff,
George B. Ross, } Committee.
W. T. Smith,

New Cars Between London and Liverpool.

The London & Northwestern Railroad Co. have just brought into use a service of new trains for the working of their Liverpool and London traffic. The trains are built on the same principle as those recently fitted with the electric light on the Manchester service, but are larger, heavier, and more elegantly furnished. They consist of four carriages, each 42 feet long, resting upon cylinder springs and eight wheels, the two leading and two trailing wheels being fitted with radial axles, which promote ease and safety in taking curves. The leading carriage contains guard's and luggage compartment and third-class accommodation. The two center carriages are saloons, with corridor, enabling the passengers to pass from end to end of both carriages during the journey. The rear vehicle consists of three second-class compartments, one third, and another guard's and luggage compartment. Guided evidently by the significant change recently showing itself in the passenger traffic, the migration of first-class passengers into third-class carriages, the company have provided no first-class accommodation in these trains except in the saloons. The saloons, however, are the finest things of the kind that have yet been produced, and are fitted with every elegance and comfort which the latest advancement in the art of railway carriage building can provide. The front saloon is a drawing room, furnished with easy chairs and settees upholstered in dark blue cloth. The ceilings and paneling of the room are ornamented with antique moldings in a light blue picked out with gold, and the light and shade of the light blue paneling and dark blue upholstery produce a subdued coloring with a pleasing effect. Off the corridor leading from this drawing-room are compartments specially reserved for ladies, and a ladies' lavatory with mirrors and toilet conveniences. The rear saloon is furnished in the same colors, but is fitted with four tables, and seats from 12 to 16 persons. From the corridor adjoining this saloon are smoking compartments and gentlemen's lavatory. The saloons are heated by small tube hot water apparatuses running throughout, and an attendant accompanies the train specially to administer to the wants of saloon passengers.—*London Railway News.*

Taxing Pullman Palace Cars.

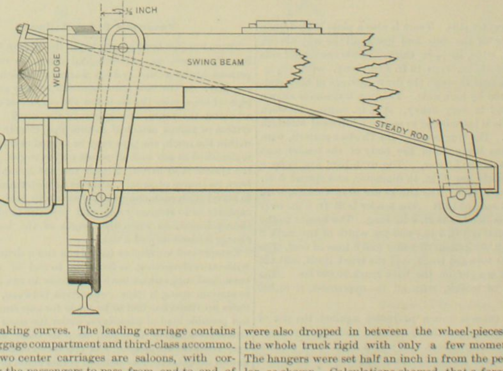
A dispatch from Pittsburgh, Oct. 6, says: The Supreme Court gave the following opinion to-day in the case of the Pullman Palace Car Company against the Commonwealth of Pennsylvania: "We think it very clear that the plaintiff in error is engaged in a company on such a business within this commonwealth as to subject it to the statutes imposing taxation. While a tax on the capital stock of a company is a tax on its property and assets, yet the capital stock of a company and its property and assets are not identical. The coaches of the company are its property. They are also operated within the State and are daily traversing from one end of the State to the other. The fact that they are operated in other States cannot wholly exempt them from taxation here. It reduces the value of property in this State justly subject to taxation here. This was recognized in the court below, and we think the proportion was fixed according to a just and equitable rule. Per curiam in the appeal of the Pullman Palace Car Company in the Commonwealth of Pennsylvania in error to the Common Pleas Court of Dauphin County, the Supreme Court handed down an opinion that a State has the power to tax the gross receipts of transportation companies incorporated under the laws and engaged in the business of transporting passengers and freight out of, into and through and within the State.

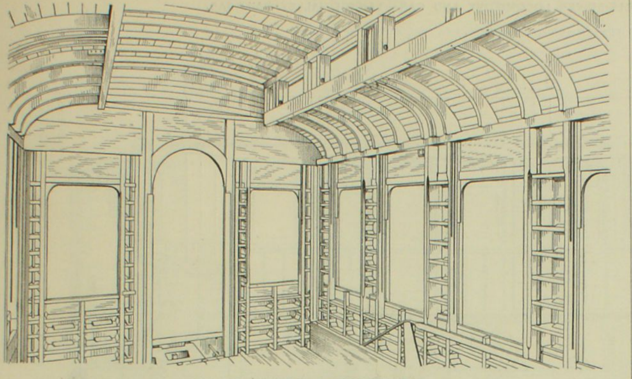
Rigid and Swing-Beam Trucks.

To the Editor of the National Car-Builder;

Your September issue contains an editorial article in which reference is made to some experiments by Mr. Mackenzie, the Superintendent of Motive Power of the New York, Chicago & St. Louis road, in regard to swing-beam and rigid center trucks. The method of making these experiments was so simple that others may think it worth while to repeat them in order to settle the question in regard to a variety of trucks. I send you herewith a rough sketch showing the form of hanger, and the method by which a truck may be quickly converted from a rigid center to a swing motion.

This has been done in a case of which the cut is an illustration. A pair of rods were put in, passing from the wheel-pieces to the spring plank on the opposite side, over which they were hooked. An angle-plate was bolted on the wheel pieces to give the rods a seat. A pair of rods were also dropped in between the wheel-pieces, making the whole truck rigid with only a few moments work. The hangers were set half an inch in from the perpendicular, as shown. Calculations showed that a force of some 72,000 pounds was necessary in order to move the swing-beam. The experiments were made on the Kansas Pacific road some years ago, and the result showed that the car had a much easier motion with the rigid truck than when it was allowed to swing. Those of your readers who are keptical upon this point can easily satisfy themselves by wedging the swing-beams of a passenger truck, and comparing its riding with that of other cars having similar trucks, or with the riding of the same car when the swing motion is free.





ILLINOIS CENTRAL PASSENGER CAR.

The engraving, produced from a photograph taken in he shop, shows the inside end and side framing of a passenger car, as built by Mr. W. B. Snow, the Master Car-Builder of the road. The short carlines of the roof are made so as to be a continuation of the curve of the clear-story, giving an elliptical form to the top, by bringing the lines gracefully down to the plates. The blocking in the sides and end is spaced very close, hardly averaging more than six inches. Glue blocks are put all round against both posts and panels, and are very light, being of white-wood carefully cut so as to make good fits. The result is a very stiff and substantial frame. The corners are held up by the long side straps and rods which pass over the transom posts or struts, forming a truss and making one end of the car balance the other. Old cars built on this plan a long time ago show that it works well, their sides keeping straight and the camber remaining as good as it was at first.

The West Albany Machine Shops of the New York Central.

On reaching the top of the heavy grade ascended by the New York Central Railroad, going westward from Albany, we reach a whole town of buildings devoted to the repair and machinery building of the road. It was a wise action locating the mechanical headquarters of the road out here, where there was ample room for extension, and the convenient arrangement of the buildings shows a strong contrast with many large railroad shops crowded within large city limits.

In the course of a recent visit, we were favorably impressed with the numerous improvements that had been made within the machine shops in the last year, and we think Mr. John Ortton deserves much credit for the excellent work done under his directions. Quite a number of new standard tools have been put in to replace those that have become antiquated, and this work is still progressing, for Mr. Buchanan believes in the policy of giving men first-class tools to work with before expecting good work from them. Among the new tools, we observed several turret lathes, milling machines and a boring mill. For the use of the boiler shop, there is also a new sheet planer and a steam-riveting machine.

There are fifteen engines in the erecting shop undergoing repairs, some of them receiving work equal to rebuilding. They are working steadily on the line of making work interchangeable, and this policy exercises a strong influence on the work of repairs. The road has inherited so many locomotives of odd sizes and shapes, that it is an intensely difficult matter to reduce them all within the scope of standards, but this is done as far as it can be carried out without incurring excessive expense. They went to considerable expense by turning a great number of engine and tender trucks of odd forms into the scrap heap and replacing them by standard interchangeable trucks, and the reform is already giving good returns, by reducing the expense of repairs. All other parts of the running-gear are being reformed in a similar way, which has already resulted in a remarkable reduction of the sizes of springs carried in stock. Steel castings are used to a great extent on this company's rolling stock, and they have proved very satisfactory in service.

Guides, cross-heads, piston spiders, rocker arms, and links are among the parts now made from mild steel castings, and for all these purposes they stand strains without breakage, and wear remarkably well. A practice is rigidly followed of dating every new article put on an engine, and certain parts are removed when they have been in service for a certain mileage. Side rods and axles are permitted to have a comparatively short life on fast passenger locomotives, before they are transferred to freight or slow-running passenger engines. The safety of running-gear is the subject of peculiar solicitude in the shops of this road. All axles are made with a wide margin of safety, the truck connections are unusually heavy, and excellent wrought-iron wheels of a British pattern have been made standard for engine and tender trucks.

In these shops all scrap metal is worked up into new form. Two heavy steam hammers are kept working up scrap iron, which is carefully selected for the intended purpose. This must have been carried out with great care, and the process of working up the selected scrap well carried out, for although a certain percentage of all axles turned out are regularly subjected to the drop test, none of them have ever broken under it.

The tool-room is equipped with the most approved standard guages, and there is a fine collection of taps, dies and reamers. While we were admiring the excellent condition in which the tools in this room were kept, Mr. Ortton said that he found fine tools were easier kept than rough ones, for the workmen were much more careful in using the former. Although in these shops the policy of doing their own work is well carried out, they find it better and cheaper to buy tools of precision from those who make their production a specialty. They also buy all their springs from good makers.—*American Machinist.*

New York City Street Cars.

An article in the local news columns of the *Tribune* says :

The loud outcry made a few years ago against the old fashioned plush-covered spring cushions, then used in street cars for seats and backs, caused them to be removed and set car-builders at work to make a car that would be light, healthy and comfortable. The general plan of perforated wooden seats with plain backs has been adopted by all the companies. They are covered with a fine quality of heavy Axminster carpet during the winter, and in the summer nearly all the cars have only the wooden seats and backs. Open cars are used on a number of routes during the summer, and this is conducive to the health of passengers. The only particular difference in the furniture of the cars is in the mats used on the floor. Seven of the lines use sectional wooden mats of plain or ornamental design, while three retain cocoa mats. Wooden mats are the easiest to clean. Cocoa mats retain moisture on damp or rainy days and emit a musty odor. There are four sets for each car and they are changed every trip on rainy days.

The First and Second avenue routes, under one management, run 150 cars; the Third avenue, 180; the Fourth, 75; the Sixth, 88; the Broadway and Seventh, 135; the Eighth and Ninth, 160; and the Tenth, 120. At the stables of each the same general arrangement for cleaning cars is used, while the details only are different, being regulated by the judgment and experience of superintendents. From six to fifteen men are employed for cleaning cars by the different companies.

After every round trip that a car makes, it is taken to the stable, the mats are taken off the floor, and two men with brooms and specially constructed brushes give it a thorough sweeping and brushing. After a car makes its last trip at night, it is run upon what is termed the wash-stand, which is a large turn-table surrounded by hydrants. Everything movable is taken out of it, and water is played from a hose on the inside and outside, while four men with scrubbing brushes and stiff brooms remove whatever dirt has accumulated during the day. After this operation the car is run upon a side track, and two men dry the inside and polish the windows.

While passengers find fault with the untidiness of street cars, superintendents have a word also of complaint against passengers. If men would not convert a car into a spittoon for the reception of cigar stumps, tobacco-spit and quids, and a garbage-box for nut-shells, fruit-rinds, cores and pits, the remnants of lunches and old papers, it would be much easier to keep up a cleanly appearance Section 167 of the Sanitary Code, which provides that no soiled article of clothing or bedding shall be carried on street cars, except on the front platform, is strictly enforced by all the companies, and it is worth a conductor's position if he is proved derelict in this respect.

Nearly all the car companies build their own cars, and all have repair-shops at their stables, and as soon as a car is damaged by a collision it is sent at once to the shop and repaired. Men are detailed to keep a strict watch over all the working parts of cars.

No metal or plate has yet been found of which to make a hand-railing that will keep bright and untarnished. Many experiments have been tried, but the hardest plate that can be obtained will not stand the friction of the hands longer than two months, before the plated metal will show through. Cars are painted and varnished at least once a year. The various parts of the car last different periods. The wheels average about eighteen months on long routes; on short routes, about two years. Steps and platforms last about five years. There is no particular limit for the floors and framework, as they are but little worn. Cars are frequently built up from an old floor or framework, but at the end of about fifteen years there is but little left of the original car.

The Frankfort Shops of the West Shore Railway.

The new shops of the company, at Frankfort, N. Y., are advancing toward completion under the direction of Mr. R. H. Soule, the Superintendent of Motive Power, and will all be ready for occupation during the ensuing winter. The various buildings are completed externally, with the exception of the engine and boiler house, the roof of which will be finished in a few days. Many of the roofs are covered with patent metallic shingles, which are handsome in appearance and a protection against fire. The two ten-ton Colliau cupolas of the foundry are in place, and setting is being arranged in a very neat manner with a brick stage in front reached by steps on each side. At the level of the tapping hole there is an iron platform going all round both cupolas. The molding sand floor is 4½ feet deep in the center aisle and 3½ on the sides. The cupolas will for the present be lined with brick so as to reduce their capacity to 5 tons each. In one of the wings of the building a temporary brass foundry has been established, which is now doing all the brass work of the road.

The power for the main machine shop will be supplied by two Westinghouse engines of 80 horse-power each. The line shafting on one side is in the hangers and many of the larger machine tools are set on their foundations. There are two lines of main shafting, one on each side of the building. Each line is driven by a separate engine, one of which is in position. The shop is at present occupied by a small force engaged upon engine repairs, etc., but is expected to be ready for running in about three weeks.

The building intended for the boiler shop is to be used temporarily as a paint shop for cars as soon as the necessary heating apparatus can be put in. The painting is now done in the planing mill, but as soon as the engine and boiler for this shop are completed, the wood-working machinery will be put in and the mill started.

The blacksmith shop is in operation, but without power. The engine is on hand, however, and will soon be ready to run. It is a Westinghouse engine, and will be placed on a platform over the door and coupled directly to the main shaft, which runs in the center of the shop. This novel arrangement has been found to work well, and has the advantage of saving much valuable floor space. The heavy machinery for the blacksmith shop is all on the ground and ready to set up.

The track yards are spacious and level, with plenty of room for any future extension that the growth of traffic may require. The arrangement is such that the repair tracks are entirely by themselves, and contiguous to them is the stock house. For the handling of material, narrow-gauge tracks will be laid between each line of standard-gauge track.

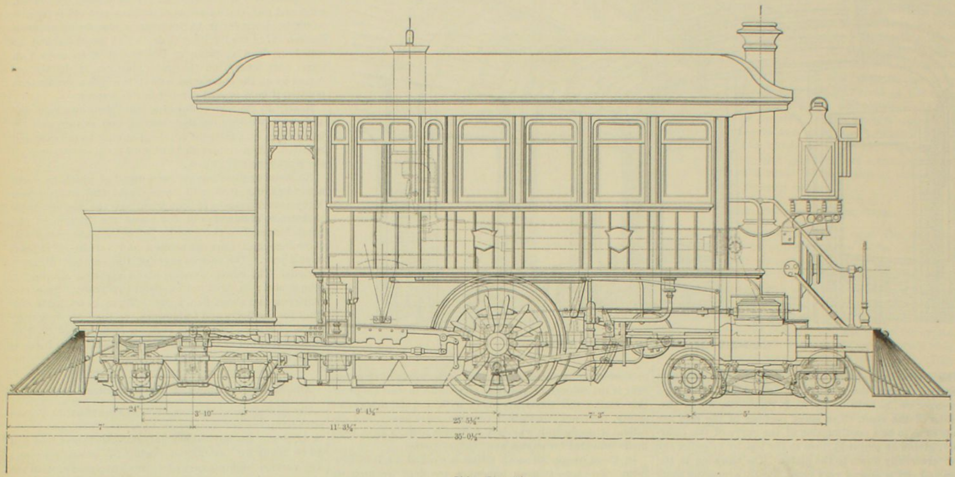
The arrangement of the shops is radial, each one being so placed that enlargements can be made without disturbing the plan or separating the departments or dividing the work. The foundry, for example, can be lengthened some 80 feet toward the central turn-table without difficulty, that amount of space being available for the purpose, and most of the other buildings may be extended to an equal or greater extent.

About 200 men are now employed at the shops, exclusive of those engaged in the yards and on the buildings.

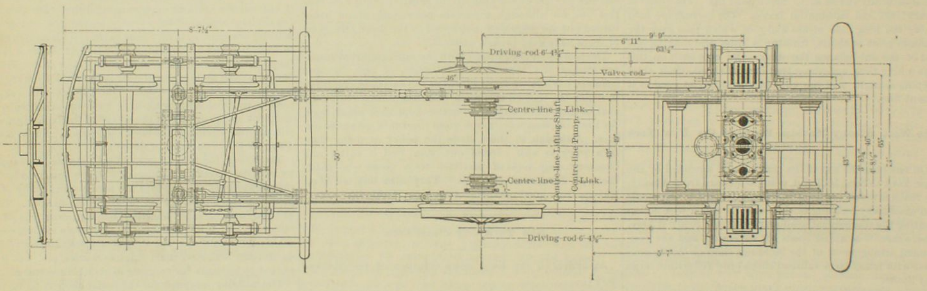
AT the annual meeting of the Pullman Palace Car Co., in Chicago, Oct. 17, the following directors were chosen: John Crerar, J. W. Doane, Marshall Field, Henry C. Hulbert, George M. Pullman, O. S. A. Sprague, Norman Williams. The only new director is Mr. Sprague, who succeeds C. G. Hammond, deceased. The board re-elected George M. Pullman President, with all the other old officers.

COMBINED SINGLE-DRIVER LOCOMOTIVE AND CAR—LEHIGH VALLEY RAILROAD.

Built at Wilkes-Barre Shops, A. Mitchell, Div. Supt. and Master Mechanic.



Side Elevation.



Plan.

This combined engine and car is designed for a service which usually calls for the use of a locomotive as well as a car. In uniting the two a material saving is made in the cost of running, two men taking the place of several. It consists of a single-driver engine, carrying the tender on the frame and having a truck and pilot at each end. The single pair of driving wheels are placed under the shell of the boiler in nearly the same position as the forward drivers of an ordinary 8-wheel engine. The front end, in design and arrangement of cylinders, saddle, truck and pilot, is not unlike an ordinary light passenger engine. The cab or car extends the whole length of the boiler, inclosing both dome and smoke pipe. Like most single-driver engines, it has shown itself capable of remarkable speeds, single miles having been made at rates considerably above those of the fastest trains. The absence of a pair of trailing drivers, and the comparatively small size of the boiler, has enabled the designer to get the fire-box into very desirable shape, as will be seen from the cross section through the dome. The water-legs are tapered and spread outward so that the steam leaves the heating surface as soon as it is formed. On each side of the smoke stack there are doors giving access to the car from the platform on the buffer beam, by steps on each side. Just forward of the cylinders there are two other steps placed so that the lower one is about 14 inches from the ground. The front half of the cab is finished very much like an ordinary car, with the exception of the roof, which is continuous and without a raised deck. At the back end of the dome it is carried up so as to project through the roof, which makes it very high in proportion to its diameter.

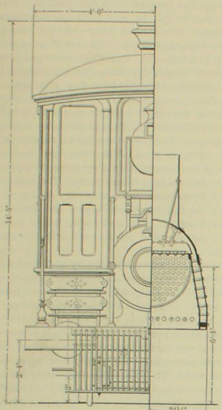
One of the peculiar features of the engine is a brake upon the leading truck. The brake itself is a curiosity in its way. It is hung inside the wheels and is without brake beams. All four of the brake blocks are operated from arms on a rocker shaft which passes through the equalizing bars of the truck. None of the ordinary forms of brake hanging are applicable between the wheels, and an outside brake was out of the question for several reasons. The brake upon the trailing or tender truck is applied in the usual way outside the wheels.

The driving wheels are equalized with the rear truck, although the distance from the center of the driving axle to the center line of the truck is 11 feet 3½ inches. The means by which this is accomplished is deserving of special attention, as it is equally applicable to any distance. The arrangement consists of two connecting rods, four bell cranks and suitable links which make the connection with the springs of the drivers and the swing motion of the truck. The load is sustained and distributed in the same way as with an ordinary equalizer carried from the center plate to a yoke resting on the driving springs, while the truck is not only permitted to curve freely, but to have the usual swing motion. Both rods are fitted with turnbuckles, by which their length can be accurately adjusted The bell cranks in the trucks have the upper or horizontal arm made with a fork, from which a link is dropped far enough to move like the ordinary swing motion link. A transom piece made with eyes passes from side to side of the truck around these links. These eyes are large enough to allow the links to swing without striking. The weight of the engine comes upon the pins holding the bell cranks, the cranks distributing it between the drivers and truck. The front ends of the front pair are connected with the driving springs, while the back ends of the back pair through the swinging links throw the weight on the truck. The relative lengths of the arms of course determines the weight that is thrown on the trucks and the driving wheels respectively. This is virtually the same as changing the fulcrum with an ordinary equalizing bar. The rods are 2 inches in diameter. The transom, or transverse bar, is 1½ inches thick and the links 20 inches long. The advantage of substituting tensile for transverse strains is a very material one in covering long distances, the construction being both lighter, as well as stronger and cheaper, and enables wheels, or wheels and trucks placed at long distances from each other, to be equalized quite as perfectly and easily as those in close proximity.

The wheels of the trucks are 24 inches in diameter and the driving wheel 46. The back frame is 3½ inches wide; forward of the driving wheels it is reduced to 3 inches and is single. The total wheel base is 25 feet 6 inches. The leading truck has a spread of 5 feet, and the trailing truck 3 feet 10 inches. The driving wheels are placed nearly in the center of the engine, being 9 feet 9 inches from the center line of the forward truck. The engine stands 14 feet 3 inches high to the top of the stack, and is 35 feet ½ an inch over all. It is fitted with the Westinghouse air pump and brake, with the reservoir below the barrel of the boiler between the frames forward of the driving wheels.

Engines of this class, though often regarded as luxuries, and frequently discountenanced by boards of directors, are really very convenient and economical, enabling superintendents and managers to go over the road with a speed and convenience quite out of the question with an ordinary directors' car and locomotive.

MR. JOHN H. FLYNN, President of the American Railway Master Mechanics' Association, and for many years Master Mechanic of the Western & Atlantic road, died suddenly at his home in Atlanta, Ga., Oct. 1, aged 56 years. He was born in Philadelphia, but went south at an early age and found employment on the above named road, with which he has been connected, with the exception of two brief intervals, till the time of his death. He was a capable mechanic and highly esteemed for his personal qualities.



Front End Elevation and Boiler Section.

Meeting of Railway Men in Buffalo.

At an informal meeting of representatives of the different railroads interested in the interchange of freight cars in and around Buffalo, N. Y., held at the Tifft House, Buffalo, Wednesday, Oct. 8, 1884, there were present the following named gentlemen:

Wm. McWood, J. D. McIlwain, Grand Trunk; R. H. Soule, T. W. Frederick, N. Y., W. S. & B.; R. C. Blackall, D. & H. C. Co.; L. Garey, E. Chamberlain, Peter Smith, R. Donaby, N. Y. C. & H. R.; A. Strouse, E. H. Bowman, P. & N. Y. C. Co.; Chas. Graham, D., L. & W.; Robt. Potts, C. S. Divs. Mich. Cent.; John Kirby, A. C. Robson, L. S. & M. S.; H. D. Titus, Southern Cent.; J. W. Marden, Fitchburg; M. Wilder, N. Y., L. E. & W.; C. J. Butler, Fall Brook Coal Co.; A. Brewer, T. & B.; H. B. Crane, A. D. Wilder, Wm. Aldersen, Thos. Rhodes, Osborne Sampson, S. W. Speer, Thos. Sills, Joint Inspector at Suspension Bridge, J. R. Petrie, Joint Inspector at Black Rock, and John S. Lentz, L. V. R. R.

Mr. Wilder being absent, Mr. McWood was called to the chair. After minutes of previous meeting had been read and adopted, Mr. McWood said: "As you are well aware, the object of our meeting here to-day is to resume discussion of the various subjects relating to interchange of freight cars, at this point more particularly, and I now declare the meeting open for discussion of whatever you may have to offer bearing on this subject."

CONDITION CARDS.

Mr. Lentz: There is one subject which I beg to bring up for discussion, and that is the use of condition cards. I do not remember whether that was discussed at Saratoga or not.

Mr. Garey: If my memory serves me right that subject was brought up at that meeting and rejected; that is, such condition cards were not to become an order to every car.

Mr. Kirby: I believe, Mr. Chairman, that was passed upon at Saratoga. The card itself does not authorize any party who finds cards on car to make repairs called for by the card.

Mr. Garey: Rule 6 says: "In such a case a card 4½ × 6½ in., in the form shown below, may be affixed under the body of the car, for guidance of other inspectors, preferably on the inside of the cross-frame tie-timber, stating the defects with which the car will be received back, and when the car is so repaired the card shall be removed.

"Any company finding a car with card on it may make the repairs noted by card, and make bill for the same to the company putting on the card, the card to accompany the bill as voucher for the work done. All cards shall be printed and filled in on both sides."

(Name of Road.)

Car No.......................... ..Date...............................

Initial.... ....Line...............................

Will be received at any point on this company's line, with the

following defects:

....

....

....

.. .. Inspector at........................

Mr. Kirby: I voted no at Saratoga, but was in the minority, unfortunately for the road I represent.

Mr. Garey: That is just my case. I would say that I write on my cards, "This card is not an order to repair car."

Mr. Lentz: I think, notwithstanding that, that any road which is a party to the rules would be liable for repairs.

The Chair: In this connection I would say that, should I find such a card on a car I would make repairs and expect to get paid for the work.

Mr. Garey: Cars are carded for old defects; the road thus carding them is not liable for such defects. It is, therefore, not a just claim for parties taking car in to make bill against company putting card on. Now, cars are carded for old defects, and nine times out of ten the company putting card on is not liable for repairs stated on card.

The Chair: That is simply to satisfy inspector receiving car that it is safe to run, and it is for this purpose, as I understand it, that this is done. I would certainly not do the work in that case, but would allow car to go home where it could be repaired.

Mr. Garey: Take for instance a Grand Trunk car received at Buffalo on its way east to Boston; it has cracked timbers; B. & A. people refuse it unless carded, and a road finding card on car makes repairs and send bill to N. Y. Central. Now that would not be a just claim.

The Chair: If the defects were old, certainly not.

Mr. Kirby: I think the great mistake we make is the manner in which we have interpreted the meaning of the rule. The card does not say that any one may repair the car, but only that car will be received at any point on our line with such and such defects. The card does not authorize the repairs, it is only our resolution which does.

Mr. Marden: I was one of the advocates of that resolution at Saratoga. If a foreign car was received at North Adams and its destination Boston, and carded for old defects, I would take the car to Boston and then send it back. Now, a car that has been damaged while on a road and we receive it from them with card is a very different thing. The Fitchburg road in that case would repair car and render bill to road putting card on. I have made it a practice, however, to ask permission from railroad companies to repair car before doing so, and think if the card system was carried out as it should be it would have the effect of forwarding instead of retarding freight.

The Chair: In loading agricultural implements and other bulky freight that was going a long way off our line, I have occasionally seen it necessary, in order to get the load in car, to deface car in some manner, making it unfit for ordinary freight. As I understand this rule, anybody is at liberty to put it in proper condition to receive ordinary freight, and charge same to party owning car.

Mr. Garey: With us most such cases are line matters. In order to get load in car belonging to this company in line service, if it is found necessary to deface car Line Manager would make settlement. I knew it is no unusual thing to deface line cars and have Line Managers settle for damage.

Mr. Kirby: I quite frequently have just such cases as Mr. Garey speaks of.

Mr. McIlwain: I think it would be well for company owning line car to settle it.

Mr. Garey: It is liable to be anybody's car.

Mr. McIlwain: The party doing defacing should settle with line.

Mr. Potts: Let agent take up the case and collect from parties defacing car.

Mr. Garey: Shippers sometimes make payment before work is done. Line Manager is immediately notified that such and such a car has been defaced, and so much money has been paid to cover damage. Car arrives at destination and Manager gives instruction to have car repaired.

The Chair: If it is an ordinary car, what then?

Mr. Garey: In that case it would be a car defaced by owner and damage made good by them.

The Chair: Then it would be chargeable to the party who put the card on it. In that case, there is the card on the car defaced, and that card states that owners will pay for repairs.

Mr. Garey: The owners place cards on cars, but it is not intended that local cars should be used for such service.

The Chair: I can show Mr. Garey cases where New York Central local cars come on our line quite often. It is simply impossible to keep cars home. I have had cars marked "local cars," but it was of no use.

Mr. Marden: I do not think Traffic Managers or Line Traffic Managers should have anything to do with the settlement of such charges. If a car is defaced in Boston, for the like purpose of loading merchandise, the Car Department is notified. If we collect payment and the car is repaired anywhere else, the Car Department arranges the proper charges, and that is where it should start from; and I claim the car settlement should protect the road receiving the car. The road receiving it should be responsible for new breakage.

The Chair: I do not think there is any car-builder in the country who would take in a car and make repairs to it simply for the sake of doing the work; there is no money in it.

P. & R. R. R. DRAW ATTACHMENTS.

The chair was here requested to inquire if a representative of the Philadelphia & Reading Railroad was present. The Secretary said notification of this meeting had been sent to the proper party. No one, however, responded.

Mr. Petrie then made the following statement:

"We have experienced considerable trouble with P. & R. cars, owing to their weak draw attachments, especially when coupled with cars not equipped with dead woods. The draw castings are bolted to the middle sills with ⅝-in. bolts, except the four that go through the jaw straps, which are ¾-in. These castings, through shrinkage of the sills and ordinary wear of draw attachments, become loose and chafe, in a great measure weakening the sills, and in this way making them liable to break just back of the castings. Their followers were originally cast. The back one is now being substituted with wrought, which is an improvement, as far as they are concerned. At the same time, while the followers do not break the draw castings and sills have to suffer accordingly. The draw-heads also are defective where the shank goes through, and very often break.

The Chair: We have a great deal of trouble with these parts of their cars and have asked P. & R. to repair them.

Mr. Kirby: There is another defect. The buffer spring is very short and light.

WHEEL GAUGE.]

Mr. Marden: I would like to get an expression of opinion from those present in regard to wheel gauge. At our last annual meeting there was a limit of gauge established, and I would like to know how wide or how narrow roads are receiving cars and consider them safe to run, and what action if any has been taken upon it?

Mr. Blackall: I would like to hear from Mr. Soule.

Mr. Soule: The limit established by Mr. Paine and Mr. Frey was 4′ 5¾″, and we have endeavored to live up to that. That limit, however, is now being changed.

Mr. Marden: We ought to know at what limit cars will be refused in order that we may have an opportunity of getting our rolling stock in proper condition.

Mr. Lentz: I agree with Mr. Marden and think this meeting should express an opinion on this subject as to limit to be allowed.

Mr. Marden: I think cars that are safe to run should be received, and parties owning cars notified to conform to gauge.

Mr. McIlwain: I agree with Mr. Marden on that point.

Mr. Marden: If it is decided that a car is not safe to run with wheels gauged between flanges, the minimum 4′ 5″ and maximum 4′ 5⅜″, I think it is due our inspectors that they have positive instructions in order that they may be governed accordingly.

Mr. Kirby: Cars that are being put upon roads by car trust companies, and built by irresponsible builders, are placed in service without any reference to gauge. I know of a line that has 250 Red Line cars, which were put in that service without inspection from anybody, and I regret to say it is a practice that is being kept up.

Mr. Kirby: I would say that at most of our large interchange points we furnish the Inspectors with a slide gauge so that they can tell exactly how wide the wheels are. In fact, you can tell to an eighth of an inch how wide the gauge is.

After considerable discussion on this subject Mr. Soule moved and Mr. Marden seconded motion, "That the Secretary be instructed in issuing the call for the next meeting to incorporate in said call a request that each road here represented be prepared to bring a sample gauge or drawing of same furnished Inspectors at interchange points."

There being some opposition to the above resolution it was moved to reconsider the question.

The following resolution was then offered by Mr. Soule, seconded by Mr. Lentz: *Resolved*, That the Secretary be instructed in issuing the call for the next meeting, he should invite each road here represented to bring to the meeting sample drawing or templet of the gauge furnished Inspectors at interchange points for examining the wheels of freight cars offered to them by connecting lines at such points. Resolution unanimously adopted.

SIZE OF AXLES AT WHEEL FIT.

Mr. Garey: There is another question I would like to have discussed, and that is the size of axles at wheel fit. I learn that some roads have given instructions to Inspectors at junction points not to receive any cars with wheel fit less than 4.″ I would like to know if it is the practice of any one present to fit axles to wheels where axle at wheel fit was less than 4.″

Mr. Kirby: I have never given such instructions to inspectors.

Mr. Garey: If the wheel fit is less than 4 in., the journal would necessarily have to be quite small.

Mr. Kirby: I don't know, Mr. Garey; it may be 2¾ in.; then you get quite a bottom; you get ⅝ in. bottom. If you should set some one examining your car journals where they were 2¾ in., I guess you would not take them out.

Mr. Garey: No, sir; the idea is to fit wheels to axles too small for service.

REPORTS OF ALL WHEEL CHANGES.

Mr. Soule: I would like to ask whether the rule requiring each road to report to other roads all changes of wheels, whether chargeable to that road or not, is being lived up to.

Mr. Lentz: I am strictly adhering to that rule.

Mr. Kirby: I have not lived up to that rule. If there is a bill to be made against parties, bill is made; but if the fault is ours we do not report to owner of car.

The Chair: We have made it a practice for years to report such changes, whether charge is made or not. If we skid wheels we made out regular bill, but make no charge. I think it is quite right to do this, especially so where parties keep wheel record.

Mr. Garey: I think the practice a good one if adhered to by all parties.

Mr. Lentz: Perhaps I am a little more interested in this resolution than most of you. We are receiving a great many short axles, and by getting this information we are able to trace and find out who the parties are that are doing this, and think if the practice of reporting all changes in wheels was carried out faithfully it would break up this practice to a great extent if not entirely. But I do not see that it is being generally adhered to.

Mr. Kirby: I would say that such work, I do not think, is done by roads represented at our meetings. I took that ground when it was brought up before, and that parties who were not doing that kind of work would report all changes in wheels, while, on the other hand, those who were doing that kind of work would not report it.

COLLECTION OF BILLS FOR REPAIRS TO CARS OWNED BY PRIVATE PARTIES.

Mr. Garey: Has any one had any trouble in collecting bills for repairs to cars belonging to private parties as per rule 19?

Mr. Graham: I would say that some bills the D., L. & W. presented were paid and others were not. I wrote to some parties to see if they were enforcing that rule but found very few who were doing so.

Mr. Garey: I certainly fail to see why railroad companies should furnish brake-shoes, journal-bearings and other parts of cars that fail under fair usage free of cost to car owners.

Mr. E. Chamberlain: Railroad companies do not receive the same compliment from them.

Mr. Graham: They claim they should be treated the same as railroad companies, inasmuch as they send their cars out in good condition.

RULE 20.

Mr. Garey: Quite a number of roads have repudiated Rule 20. Those of you who were present at the revision of rules at Saratoga, last June, will remember that I voted against and opposed this rule, but was compelled to submit to the majority.

Mr. Kirby stated that he opposed the resolution.

Mr. Lentz: Suppose, Mr. Kirby, you deliver a car on private track, is L. S. & M. S. responsible?

Mr. Kirby: No, sir.

Mr. Lentz: Then I understand your road adheres to the rule. I ask whether the L. S. & M. S. is responsible for damage to car in case it was destroyed?

Mr. Kirby: We do not adhere to it? The Lake Shore, however, would be responsible for restoration of car.

Mr. Garey: They would be held responsible as an employé.

Mr. Marden: It would appear to me that Lake Shore should make settlement with parties doing switching service.

Mr. Lentz: We load a great many Lake Shore cars. In case one of your cars should be side-tracked, would you look to owner of side-track for settlement in case car was destroyed?

Mr. Kirby: We should look to the Lehigh Valley.

Mr. Marden: I think it only resolves itself into this question: Would we be considered a private line in handling that car? It is a question which could only be settled by law whether we would be held as a corporation or private line.

Mr. Lentz: Do they get any freight for handling those cars from point of loading to your road, Mr. Kirby?

Mr. Kirby: Sometimes they do.

Mr. McIlwain: The last line in carrying freight receives a pro-rata of that.

Mr. Kirby: The last company to whom you deliver cars is responsible.

Mr. Blackall: It would be a question of law.

ORGANIZATION OF PERMANENT CLUB.

The Committee appointed at the last meeting to consider as to the feasibility of a permanent organization of master car-builders at Buffalo similar to those at other points reported through Mr. McIlwain as follows: "In regard to a permanent organization at Buffalo, your committee would report that they have only had a short time to talk the matter over, but would say that, in their opinion, it would be unwise at this time to organize a regular club at this point, but would recommend informal meetings be continued as heretofore, and would further recommend that a permanent President, Vice-President and Secretary be elected at this meeting, to serve through the fall and winter."

Mr. Kirby: Mr. McIlwain's remarks are my ideas on the subject exactly.

The report was accepted and adopted.

The Chair: The report being adopted it will now be necessary to elect at this meeting officers for the ensuing year.

The following named gentlemen were elected by acclamation:

Mr. Wm. McWood, President; Mr. John Kirby, Vice-President; T. W. Frederick, Secretary.

It was decided to hold the meetings every two months during the Fall and Winter.

On motion the meeting adjourned to convene on the second Wednesday in January, 1885, at 10 A. M., at the Tifft House, Buffalo, N. Y. JOHN S. LENTZ, Secretary.

MR. S. L. WHITE, Master Mechanic of the New York Central Shops at Syracuse, is now working about 200 men. The shops have ten repair tracks which are now full of engines. The repairs comprise the bulk of the work done in the shops, though there is some building going on most of the time as opportunity permits. Mr. White has just completed a new and handsome passenger engine, with 17x24 in. cylinder and a wagon top boiler. The latter is 50 inches in diameter and has 100 2-inch tubes. The wheels are 70-inch. The firebox is fitted with a Blanchard water table which has proved very successful on one of the engines. Another engine of the same size of cylinders, and boiler of the same pattern, is under way and progressing rapidly.

NATIONAL CAR BUILDER

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WM. E. PARTRIDGE, } *Editors.*

NOVEMBER, 1884.

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of each month.*

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L. SCHAFFNER, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*

WILLIE H. GRAY, 306 *Olive Street, St. Louis, Mo.*

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CAR COUPLERS.

Railway men and others who are interested in the car coupling problem, will await with some solicitude the report of the Railroad Commissioners of Massachusetts giving the result of the tests that are being made preparatory to a compliance with the law requiring all new freight cars owned by the railway companies of that State to be equipped with automatic or safety couplers after the first of March next. Considering the large number, even of the better class of these devices, the rivalry between competitors, and the harvest of profit involved in the selection which may be made, it is no wonder that the decision of the commissioners is regarded as an event of the first importance. It will be an official discrimination in favor of a limited number of these devices, and render unnecessary any further tests of the large number that fail to receive the stamp of approval.

The law as it stands gives the commissioners discretionary power to "annul any recommendation made by them," which we understand to mean that, after recommending one or more couplers as required, if any shall subsequently come to their knowledge which in their judgment fulfill the conditions better than the previous ones, they will under the law be substituted for them. The action of the commissioners and legislature will, therefore, at no time be final, but will admit improved devices that may be brought out in future to be entered for competition with those already in use. This arrangement would seem to suggest that if established standards are liable to be changed, except at long intervals, the cost to the roads would be a matter worth considering. There is a growing feeling that something must be done, either under the spur of compulsory legislation, or to meet the pressing need of greater economy in the cost of repairs. The existing evils are growing with the growth of railway service, and the difficulty of dealing with them is increasing every year. This is manifest from the tone of the discussions in car-builders' meetings when couplers are talked about. A greater willingness is expressed to lay aside individual preferences and agree to anything that has any chance of being adopted by the roads generally. Any effectual remedy must in the nature of the case be general in its application and not local. The interchange of traffic makes this imperative. We do not, therefore, expect to see any very great number of Massachusetts cars equipped with legal couplers after March next, simply because the movement to bring it about is restricted to the comparatively small number of roads within the jurisdiction of a single State, and a small State at that. The probability is that it will progress to a certain point and then hang fire, in anticipation of some more effective and general action by the roads themselves—the great East and West lines that own the largest number of cars.

The Car-Builders' Association have so far done little more than discuss and suggest, and even if they had given their unanimous approval to some particular coupler as the best attainable device—a thing hardly supposable—they could not compel a single road to use it. The united action of all the principal roads in the country is absolutely indispensable to the adoption and use of a uniform draw-bar or coupling device. Local State legislation will not bring it about, because the evil is not local, but ramifies through all the network of a vast interchanging traffic. The Association passed a resolution last June asking railway companies to defray the expense of making tests, and designating Mr. M. N. Forney to superintend and record the testing, but, so far as we are informed, the resolution is not likely to be prolific in results. The New England Railroad Club also have adopted a resolution proposing to call a national convention of delegates authorized to act for the railway companies of the United States and Canada on the coupler question only, and to take steps for the selection of a standard. This, it strikes us, is a movement in the right direction; but to carry it to a successful result will require not only time and money, but first-rate mechanical skill, and, above all, honesty and impartiality in conducting the investigation. Railway companies have the money, they have all, or nearly all, the men capable of doing the work, and they also have the power to enforce the use on their respective roads of any standard that may be agreed upon.

As regards the particular kind of coupler that should be made a standard, it would be presumptuous in us to throw out even a hint, in view of the diversity of opinion among those whose daily occupation is the coupling and uncoupling of cars, to say nothing of the conflicting views of inventors who have for years been wrestling with the fascinating problem, and who, although they can't agree among themselves, are presumed to know more about it than the general run of people. From the fearful record of lives lost and injuries received in coupling cars, we have been led to believe that *safety* is the primary and all-controlling consideration in determining what kind of couplers shall be used. Every thing, it would seem, should be subordinate to the this one requisite. They may be cheap and simple in their construction or costly and complicated, they may be automatic or not, couple with link and pin and fifty other styles already in use, but they should, as far as possible, meet all the requirements of safety. If safety however, is not the chief requisite, but only an incidental matter subordinate to economy of operation and service irrespective of peril to life and limb, it would be better to have it so understood. The problem is replete with embarrassment, complication and difficulty owing to the numerous conditions to be provided for. Some are for links and pins, and say that all the trouble with them is owing to the bad material of which they are made. Others regard them as a nuisance, no matter how well they are made. Some are looking to the future contingencies of increased speed and heavier trains, making automatic brakes and stronger couplings indispensable. It is also suggested that if trains made up of 10-ton cars break in two at ordinary speeds, what is to be expected of fast running trains, composed of 30-ton cars held together by link and pin slack couplings? The problem in its various aspects has grown to such proportions that it is fast becoming too big a thing to handle. In fact it is daily getting to be more evident that the only practicable solution lies in the concurrent action of the railway companies themselves, through a delegated body, with ample means and authority to test and decide, each company pledging itself in advance to abide by the result and rigidly conform to its requirements whatever they may be.

THE METRIC SYSTEM.

The letter which we publish on another page from Coleman Sellers, upon the Metric System, is one which deserves careful reading and consideration by all persons who have an interest in mechanical matters, even though that interest be remote. As most of our readers know, a strong movement has for a long time been on foot in this country looking to the adoption of the French system of weights and measures, and an effort will doubtless be made, ere long, to enforce the use of these measures by law. As an enforcement of this kind would entail a vast expense upon the people without any corresponding advantage, and with many serious and fatal objections, it seems to be imperative that the subject should be thoroughly discussed.

It is a fact which should be accepted as an axiom, that any standard of measure should bear a certain relation to the measurer. The lengths of all our English units appear to have been derived by a system of averages from measurements of the human body—as, for example, the yard is half of the span of an adult man of good size. The foot is a third of this, etc. Probably ninety per cent. of all the measures of length that have ever been current in the world are definitely derivable from this, and the variation on which the opponents of the system lay stress have arisen from the absence of a proper means for verification, and not from differences in the standards or originals. To the practical man, these measures have a value which none others can have, in that since they are derived from dimensions of the human body they are conveniently handled in the shop or in ordinary work. The units are convenient and numerous, as is necessary for a variety of work. Increase the length of any of the units and they become inconvenient and awkward, while to decrease them to any considerable extent causes inconvenience in numeration.

So long as most pieces of machinery and the majority of man's handiwork is symmetrical, and is designed or drawn from center lines, so long will the most convenient scale for use be that in which the common fractions are used in dividing the unit. Here the objection to the metric system is not alone that its unit of length is inconveniently large, but that the decimal system is not a convenient one for actual use on the drawing board or in the shop.

One point which Mr. Sellers has frequently spoken of in private conversation, and which he might have included in his letter, is that mental arithmetic becomes a practical impossibility with the decimal system of notation. In the United States, when the halves, quarters, eighths and sixteenths of a dollar went out of fashion, mental arithmetic ceased to be. The questions which our fathers and grandfathers solved mentally with ease when they reckoned in sixpences and shillings are impracticable, and are now solved by means of pencil and paper. If any further proof was needed of the value of the common fractions for computation, it would only be necessary to refer to the strong hold which the shilling has taken in all parts of the country. In New England, to this day, both the shilling and the sixpence are used for computation by people who never saw a shilling in circulation, and who have only learned it as a convenient method of facilitating their business transactions. With all its convenience, decimal arithmetic needs pencil and paper for its accurate use.

A slight change in our weights, or rather our measures, would enable us to conform our systems of weights to those of Great Britain, and give us all the advantages that any metric system could have, with few or none of its drawbacks. In England, the old Winchester gallon has been abolished, and the new or imperial gallon adopted, which is made to contain ten pounds of water at a standard temperature. This brings about some changes in the size of measures of capacity which are immaterial and not costly, but leaves our other standards as they are. Of the evils of the purely French system, and of the impossibility of completely introducing it, Mr. Sellers gives a most vivid picture which ought to be thoroughly studied by those who are endeavoring to bring about its universal use.

STANDARDS.

After all that has been said upon the subject, standards in railway equipment are not likely to be other than local, or as pertaining to particular roads or system of roads, except as far as they are indispensable to the economical interchange of traffic between all the roads of the country. For this purpose a uniform gauge of track became necessary, and practically we have got it. No one questions the accruing advantages, although the uniformity is not yet as perfect as it should be and will be, nor does any one doubt if the same principle were applied to the various parts of cars the result would be an immense saving in the cost of maintenance.

Years ago, attempts were made to bring about uniformity in the height of draw-bars, and in the form and proportions of axles, and every railway man knows the result. As for wheel patterns and gauges, journal brasses, draw-bars, couplings, dead blocks, etc., the diversity is rather on the increase than otherwise. This is easily accounted for; in fact, it is unavoidable in view of individual preferences, private interests in patents covering alleged improvements, and the desire of those connected with the mechanical departments of a multitude of roads to originate something a little better than some other road has got. It is, indeed, a question, whether, if the entire drawing and running gear now in use on freight cars could be wiped out and annihilated, so as to leave a clear field for renewals, the result would be even an approximate uniformity. The chances are that it would not be. The old experiences and preferences would remain, and these would have to be fused into some sort of unity as a condition precedent to replacing the old order of things with something better. It is manifest that under the voluntary system, which leaves each road to do as it pleases regardless of what other roads do, there can be no standards except local ones, and even these will be liable to periodic changes more or less frequent. It really seems as if compulsion in some form is the only means by which general standards, for the better protection of human life and lessening of the cost of car repairs, can be brought into use. The problem has reached a stage when mere numerical estimates of lives sacrificed and expenditure wasted are of little avail. Compulsion means, of course, the interposition of law; and even were such a resort expedient or practicable under our system of government, it may be said that in practice it would be more of a hindrance than a help, by putting a stop to all improvement upon existing appliances and devices. It can not be denied that this objection has great force, for it would be presumptuous to assume that improvement in this class of inventions has reached its climax. We do not therefore expect that the threatened government interference, by prescribing what particular brakes or couplers shall be used on cars, will practically amount to much. At all events, it makes very slow progress in England so far as power-brakes are concerned, and England is supposed to be a more congenial soil than ours for the development of that kind of thing.

That the time has not yet come for obstructing the march of improvement in railway equipment, is attested by the history of the so-called standard axle since its adoption by the Car-Builders' Association in 1873. Such an axle was then considered needful by a large portion of those who voted for it. Its adoption was a compromise between the extremes of progressive and conservative opinion, the progressives getting as heavy an axle as they could, but not as heavy as they wanted. Time has more than vindicated their wisdom and foresight. The requirements of traffic have outgrown the axle, and it ceases to be a standard just as it seemed to be in a fair way to become one; that is, if no account is made of the numerous modifications of its original dimensions by different roads taking off a litttle here and adding a little there to suit individual taste and convenience.

The attempts now in progress to agree upon a standard freight car truck, involve not only an axle of changed dimensions, but a multitude of subordinate details in regard to which there is little or no harmony of opinion or practice. To determine what is really best as a material, what kind of bolsters, bearings, brake gear, etc., are preferable it has been the practice for committees to solicit the views of car-builders and others by means of circulars, and then, by canvassing the replies reach a sort of general verdict as to the gist and truth of the matter, but derived from no thorough and scientific testing, and which upon analysis yielded no permanent or satisfactory results, but only proved, what hardly needed any proof, that something more than a mere preponderance of opinion is needed to demonstrate the soundness of any particular theory or form of mechanical construction. There must be positive knowledge from some source. Mere voting don't determine facts—except the fact of voting.

It must, we think, be admitted that in the present condition of things the advantages that would be likely to accrue from a rigid adherence to standards of drawing and running gear, provided such standards could be agreed upon, would more than outweigh the possible benefits that might be derived from future improvements, at least for a considerable period of time. To wait for the discovery of better methods by and by, instead of making use of the best that are now available, is equivalent to indefinite postponement. The time will probably never come with respect to railway appliances, when something better may not be looked for and made a pretext for further waiting. As bearing upon this view of the subject, we may refer to the code of technical regulations adopted some years ago by the railroads of Germany in respect to the dimensions of cars, size of wheels, axles, wheel base, springs, buffers, etc. This code, we believe, is still in force, and is conformed to as an obligatory rule. It is not left to the discretion of the companies as mere parties to an agreement. To prevent these regulations from operating as a barrier to improvements, they are subject to periodical revision, the object being to secure substantial uniformity, at least for a certain period of time. This is what the railway companies in the United States are professedly aiming to accomplish, but so far with indifferent success from lack of co-operation on the part of a multitude of independent corporations, with no impelling inducement except the somewhat discordant suggestions of the respective heads of the mechanical departments.

KEEPING MEN UP TO THEIR WORK.

The question of how men can be kept up to the standard of workmanship, whether in locomotive or car departments, or in any general manufacturing business, is one which causes superintendents, car-builders and foremen generally no small amount of study and anxiety. The failure of men to work accurately to gauge, and to finish up to the highest requirements laid down for quality, involves, in these days of interchangeable work, so much expense and such a multitude of annoyances as to make even the most cursory discussion of the subject of some interest.

The simplest and most direct method of insuring perfect work is that of a rigid inspection by a man appointed for the purpose, and the charging back of the work and the material to the man through whose fault a given piece has been spoiled. In some lines of manufacturing this system is eminently practicable. Close gauges, a multitude of workmen and an immense quantity of work to do, render it impossible for favoritism to produce any ill effect, and in the sewing machine establishments the penalty is a sufficient admonition to the workmen. In some of our great car building establishments the system must be modified. The cost of the work and of the raw material is in many cases so insignificant a matter as to make a penalty unnecessary. In one large car manufactory where iron or steel templets are used both for gauging and sizing the work, as well as for inspection, much ingenuity has been shown in keeping workmen fully up to the standard. Usually, especially with boys, a reprimand comes first, and if the offence is repeated the youngster is "laid off" for a week, in which case, as most of the apprentices are of American parentage, sufficient pressure is brought to bear upon them at home to entirely prevent a repetition of the offence. In some cases a forced leave of absence for a couple of weeks has been found sufficient to effect a radical cure. The bulk of the workmen having served an apprenticeship in the shop, such a lesson is usually sufficient for a lifetime. With respect to outsiders an occasional discharge is necessary, with sufficient publicity accompanying it to make the cause known.

In one of the foundries of a large machine tools establishment, in Philadelphia, the discipline is especially rigid, but even there it is occasionally found necessary, merely for the sake of the moral effect, to condemn a casting of fair quality which might be worked up without detriment to the reputation of the establishment or the soundness of the machine.

In a large foundry, in Cleveland, within a year, carelessness in the casting of a fly-wheel was considered a sufficient justification for the discharge of the foreman and every man connected with the molding of the wheel. This seemed an exceedingly severe measure, but straws had been pointing for some time previously in the direction of carelessness.

An ingenious system is employed in the establishment of Goodell & Waters, of Philadelphia, and differing somewhat from those found elsewhere. There is an inspector of work as well as an inspector of machines, but the firm guarantee the perfection of every machine and tool which goes out of their works, and in case of a defect occurring anywhere, either in the casting or finishing, it is charged, not to the man who performed the faulty work, but to the man who erected the machine or who put the individual parts of it together. As the erectors have gauges, and must know the condition of every piece entering into the construction of a machine, they become the most efficient of inspectors. When a piece of work is found to be defective and thrown out, the cost is at once charged up to the workmen, who are held responsible for the defect. This plan has the effect of making each man an inspector, not only of his own work, but also of the work of every other man engaged on the same job, and when extended through the entire establishment, it practically devolves the duty of inspection upon the whole force collectively, the actual test of usage being the final test.

PASSENGER CAR DECORATION.

The prevailing style of interior finish for passenger cars is not well adapted to decorative ornamentation; that is to say, the decorative artist finds it somewhat difficult to superadd any thing to the surface finish that will be in harmony with it, and at the same time so distinct as to assert itself as ornament instead of being too much identified with the mere construction. Solid wood finish, with nothing but moldings of one kind and another to diversify it, can be made to look very handsome by filling, rubbing and varnishing, but it suggests, or rather seems to call for something additional in the way of carved work of some sort in order to break the montony of plain surface and make it subordinate to something that will help to make the whole more attractive and satisfactory to critical eyes. Although well executed carvings from good designs are always beautiful, they have at the same time the disadvantage, as applied to transient structures like railway cars, of being a little too permanent. However desirable such an element may be under other conditions, it is not so well suited to car embellishment, especially when one prevailing style succeeds another at short intervals in accordance with the freaks and fancies of builders and road officials. The cost of carvings is another objection which has a good deal of weight in preventing their use except in special cases, and on special cars.

As a matter of economy, color decoration is more desirable than any other, for the reason that it admits of change and renewal at a moderate expense, each change being virtually a new finish. The tendency at present is toward the use of wood exclusively for inside finish, and even for roof ceilings. Correct taste would seem to require that, in this state of things color should be used sparingly, and that its purpose should be to harmonize or contrast with the rich colors of the wood upon which it is applied. The yellow-browns, or "wood colors," so-called because they are the prevailing tints of our lighter colored woods, are extremely effective in themselves, and with these for a ground it is very difficult to produce extensive color schemes or harmonies, as most painters are aware. Practically, about all that can be done in such case is to use a small quantity of brilliant color emphasized by a strong outline. The great question is to determine what the style shall be. Some of the new cars built at the West have small panels of color work filled with interlacing ribbons of color twined and interwoven so as to form beautiful and intricate patterns. This style of work is familiar to every one who is acquainted with the Anglo-Celtic or Celtic style of illumination. It is also called Anglo-Hibernian. It originated in Ireland, from whence it spread to England, but made very little headway on the continent.

The history of this very beautiful style of decoration is of little interest except to the illuminator who desires to become skilled in his art, so as to be able to reproduce the splendors of the old manuscripts. Its characteristic features, however, are peculiarly adapted to the ornamentation of passenger cars in their present stage of development. The principles involved are few in number, and may be formulated as follows:

1. One or two narrow ribbons of color diagonally and symmetrically interlaced, and forming an endless variety of patterns.

2. One, two or three slender spiral lines, coiling one within another till they meet in the center of the circle, their opposite ends going off to other circles.

3. A vast variety of lizard-like animals and birds, attenuated to the last degree and coiled one within another, with their tails, tongues and top-knots forming long narrow ribbons irregularly interlaced.

4. Series of diagonal lines, forming various kinds of Chinese-like patterns.

These were originally designed for small spaces or compartments, shields, escutcheons and the like, and would seem to be well adapted to panels and spaces in cars. The general effect often resembles a regular diaper, but as the eye investigates the interlacing patterns the curious details are perceived more and more. The patterns which have been used for car decoration so far, have not by any means been examples of the highest style of Celtic ornament, but they are a meritorious novelty and may possibly win a wide and lasting popularity. One favorable feature of the style is the fact that it is quite as applicable to carved work as to color. Some of the latest architectural work in the city of New York is strictly Celtic in its character. In brass work particularly happy designs might be made, the salient feature of the style being peculiarly appropriate for reproduction in cast metal.

STEALING IDEAS.

In no country in the world is a higher value placed upon ideas than in America. From the earliest times their property value when placed in a concrete form has been recognized. Whether this comes on account of the fertility of the American in ideas, or because ideas are of more value here than elsewhere, does not appear. Our patent system, however, is based upon the principle that a man has an exclusive right to the fruit of his brain, and the public stipulate to buy his invention, whatever it may be, guaranteeing his exclusive right to it for a term of years.

Unfortunately, there are a vast number of inventions which are not of a patentable nature. Designs, although in many cases more valuable than patents, are practically without protection, and proportions of parts and the arrangement of details, while costing long years of experience, are entirely beyond the reach of patent protection. Under these circumstances it becomes a serious question among manufacturers how they shall best protect themselves. In case of new designs, new ideas in finishing or in furnishing, the plan has usually been to conceal them as far as possible from the public, showing styles only to purchasers. Many firms dealing in ornamental work have carried this to a great extent, and actually hope by a system of concealment to prevent their designs from being pirated by others. In the designing of machinery the same plan has been adopted repeatedly and the greatest effort made, even in advertising, to withhold proportions and particulars as far as possible, and never, under any circumstances, to show anything more than photographs or engravings of elevations. Secrecy as a policy is a mistaken one, and in no case does it prevent piracy. Those who wish to steal will do so even in spite of bolts or bars. As long as things have to be sold to the public, all who wish to steal can do so without the least difficulty. Numberless examples might be cited where piracy has been practised even in processes which have been kept under lock and key. The worst feature of such piracy is that no one knows who the "original Jacob" is, and consequently no moral obliquity is imputed to the thieves. If one person or firm designs a novel style of hat-rack, umbrella holder or seat-arm, and attempts to keep it from the eyes of the public, showing it only to purchasers, his competitor pirates the design and coolly tells the first purchaser that he has something new and "entirely original with ourselves." If the name of the designer is mentioned, the pirates will calmly call him a thief, and in the general piracy which follows the introduction of the popular design, the originator will probably be looked upon as the worst depredator of all. In machinery the case is exactly similar. When a patent is run out, or when an unpatentable idea is introduced into the market, the pirates seize upon it and unite in calling the inventor a thief and a copyist. This was exemplified in one of the largest establishments in the machinery line which went out of existence in the great financial crash of 1873. Their machinery was almost universally of an original type. It was well proportioned and particularly well adapted to the uses for which it was intended. Most of its work was of such a nature as to render it impossible of protection by means of patents. During its life no establishment in this country had a greater yet undeserved reputation for piracy. Its plans were copied in all directions, not only in detail and arrangement, but as a whole, and as a reward the copyists defended themselves by asserting that the originators were the great arch plunderers.

Fortunately there is a method becoming generally recognized of avoiding many of the evils referred to. The inventor at least may free himself from the stigma of piracy and throw it in the teeth of those who really convert his ideas to their own uses. When an originator of a novel design follows Mr. Ben Pitman's plan of putting it on paper and publishing it to the world, the very publicity, and the fact of being the first to publish, establishes his right to the title of inventor or designer, and after publication it is impossible for a copyist to appropriate the design without being branded as such by the public. When a man has appeared in print and claimed a thing, the very fact of his priority is prima facie evidence that he is the rightful owner.

Repeated instances might be mentioned where designs have been secured to the original owners in spite of the desire of moneyed sharks to appropriate them, because publication had made the theft too barefaced to be tolerated.

In one establishment where machine tools for railways were built for years, and where special devices and unusual ingenuity were the rule rather than the exception, it was the practice of the superintendent always to show with the greatest freedom every one who came to him, not only the shop and the methods of working, but also the details of drawings. In repeated instances men from large establishments came with the intention, as was afterward learned, of getting a few points on special machines and building the tools for themselves. When the errand was suspected, which was frequently the case, the visitor was taken through the shop and shown the special tools, the dodges and wrinkles for doing the work, and then escorted to the drawing room, where not only the general but the detailed plans for the whole class of machines were shown and explained in detail. In fact, every possible pains were taken to impart information, and the general result, or at least a result which occurred so frequently as to be set down as the rule, was that a man would return home, carefully consider the matter in all its bearings, and conclude that it was cheaper and better to order than try to build from the stolen ideas.

The greatest amount of secrecy is usually encountered in those establishments where designs have to be bought and paid for, no designer or original mind being employed. If, for expample, a car manufactory keeps no first-class painter capable of originating its own designs and colors, and has to buy its colors and color schemes, it is of necessity chary about parting with them. If its designs for painting and decorating are obtained outside, it can not in justice to itself allow them to be seen. On the other hand, those establishments where designers, master painters and capable men are generally employed in their respective departments, it makes little or no difference whether the design is copied provided the establishment gets the credit.

It is unfortunate that, morally, the stealing of a man's ideas is not looked upon in the same light as taking his property without permission. Public opinion tacitly assents to the theory that it is all right so long as you are not found out. Protection, therefore, can only at present be had by making the discovery, the invention, or design public at once and thus putting a brand of ownership upon it.

HANDLING CARS ON THE BIG BRIDGE.

The difficulty in handling the cars at the ends of the East River bridge is one of the reasons assigned by the trustees for the limited number of passengers carried, and for not increasing the facilities for carrying them. The system of switching, as now arranged, is similar to that on any double track road for transferring trains from one track to the other. At each end of the bridge a four-wheel tank switching engine takes the train of two cars after it leaves the wire rope, pulls it out to the switch and then pushes the cars back alongside the platform on the other track in readiness for the return trip. When the bridge was first opened, a complicated system of wire rope switching was tried, but soon proved to be impracticable. Unless more space can be obtained, the two cars that are now run in one train are all that can be conveniently handled at either end, which of course limits the capacity of the bridge to the number of cars that can be handled within a given time. This is the conclusion to which the trustees have apparently arrived; but a little further investigation might convince them that a very great improvement upon their present methods is possible with a comparatively small expenditure, and with but little alteration in the terminal tracks.

Mr. William Wharton, Jr., of the Wharton Railroad Switch Co., of Philadelphia, invented some time ago a device for handling cars where the terminal facilities are limited, and which is in practical operation, as applied to street cars, near the bridge entrance on the Brooklyn side. This device, in its simplest form, consists of a transfer-table placed upon a slightly inclined track. The table is counterbalanced by weights so as always to remain at the upper end of its track, with the rails upon it in line with the track from which the cars are to be switched. When a car is run upon it, by gravity or otherwise, the additional weight overcomes the counterbalance, and the table with the car upon it rolls down its track until stopped opposite any desired line of rails, if there be several, or to the other track if there be but two. This arrangement, applied to the bridge termini, would allow the cars to be run by gravity on to the transfer-table and alongside the platform. As soon as the passengers are out of the cars after arrival, a catch would be released and the table would move by gravity across to the opposite platform, carrying the cars with it. The movement of the table could be regulated and controlled by a brake attachment. When the cars are ready to start, the brake on the cars, or a trigger-stop in the track, could be released, and the cars run forward by gravity to the point at which attachment to the grip is made. The transfer-table, as soon as the cars leave it, would be drawn back automatically to the opposite platform by the counterbalance, and in readiness for the next car.

With this system there are no switches, nor switchmen, one brakeman on the transfer table being able to manage the whole process. No room is needed except what is necessary for the trains when standing at the platforms on the main track, the movement of them being sidewise from one track to the other. The time for transferring a train of three or four cars ought not to be more than 12 or 15 seconds. The switching of a train by the present method takes from 60 to 70 seconds, inasmuch as it has to be hauled out twice its length and returned the same distance, the whole movement amounting to ten or twelve car lengths. There is room at the New York terminus to handle, on the plan proposed, six bridge cars with plenty of room to spare. At present, two of these cars fill the switches entirely. As applied to horse cars at the Brooklyn end of the bridge, the system is automatic, the car taking care of itself from the time the driver detaches his horses till he is ready to hitch them on again on the other track. This plan, if applied to the bridge cars, would enable more cars to be handled in a given time with the present available space, more passengers could be carried and the cost be very considerably lessened.

THE BUSINESS DEPRESSION.

A great many people are sadly puzzled over the "business outlook," and can not account for the existing depression in any way that is quite clear and satisfactory. One thing is quite evident, even to the dullest apprehension, and that is that the situation is vastly different from what it was two and three years ago. But to analyze the causes and forecast the future with absolute certainty, is what none of the financial prophets seem capable of doing. We confess to a little perplexity ourselves in dealing with the problem. But the climax of bewilderment seems to have been reached by a prominent New York iron merchant, who wrote to a Western friend that he had been puzzled all summer to understand how there should be so many failures of banks and business houses when money was so cheap, and that he had finally come to the conclusion that the only way for everybody to get on their pins again, was to "work like the devil and not spend a cent." Without intending to question the correctness of this theory as an abstract proposition, we are under the impression, nevertheless, that a vastly greater number of people than this New York iron merchant has any idea of, are just now doing what he so confidently recommends. They are working with all their might to find something to do that they can get paid for doing, and are not spending a cent because they haven't got a cent to spend, and yet they don't get on their pins again to any extent worth speaking of.

If the actual causes of the prevailing dullness could be ascertained, and all their complications clearly set forth so as to be understood, it is doubtful whether it would be of much practical benefit in preventing similar causes and complications in future, to be followed by the same or similar results. Any one who takes even a cursory glance at the progress of railway construction in this country during the past fifteen years, in connection with the growth of population and the extent of the grain products from year to year, can hardly fail to see that these are the elements to be looked to for clearing up the mystery. In 1872 there were 5,878 miles of railway built, and in 1875 the construction was only 1,712 miles—a falling off of 4,166 miles in three years. It has been estimated that the actual cost of the roads built in 1872 was $125,000,000 more than that of the roads built in 1875, the decrease in expenditure telling with disastrous effect upon the iron and equipment industries, throwing great numbers of people out of employment and cutting down the wages of those who were not thrown out. The revival of railway construction which began in 1879, culminated in 1882, during which year the new construction reached the enormous figure of 11,596 miles. The new construction so far this year (1884) is reported to be 2,932 miles, and for the whole year can not exceed 3,500 miles, or 8,096 miles less than in 1882. This represents a diminished expenditure for new construction during the present year, as compared with 1882, of $250,000,000 or thereabouts, which is equivalent to so much capital withdrawn from active employment in stimulating iron and steel manufacture and a host of collateral industries. The effect cannot be otherwise than what is witnessed every day—a general dullness in almost every branch of trade and manufacture that is at all dependent for its vitality on new railway construction.

It may be asked why there is so much more railway building in years when materials and labor cost most than in years when they cost least. In 1876–7 and 8, when the prices of iron and steel and rates of wages were lower than they had been for many years, only 7,680 miles of new road were built, while in 1880–1 and 2, when the ruling prices were extravagantly high, no less than 28,559 miles were built, and car and locomotive builders were overrun with orders, and their customers had to stand in line and wait their turn to get an order entered for delivery six or nine months ahead. The reason of the spasmodic craze which then prevailed, if there was any reason in it, is not far to seek. It is an irrepressible instinct of human nature which crops out more decidedly, perhaps, in Wall street than in any other locality of the same superficial area. The "ground floor" has no special attraction for the great waiting crowd until the rush begins, and then in the frenzy to get in any way, at any price, and all at once, a "boom" is started which is only checked when it has run its course and the point of reaction is reacned. This "insanity of capital," as it has not inaptly been called, has been the cause to a great extent of the irregularity in railway construction, and the excessive cost of the roads built between 1868 and 1873, and 1879 and 1883.

Another element which tends to aggravate the existing state of things is the extraordinarily rapid increase of the population of the country, estimated at 6,785,000 since the census of 1880, including, of course, the heavy immigration during the past four years, amounting to 2,600,000. Only a small proportion of this number come prepared to settle and begin the cultivation of land, the remainder being thrown upon the labor market, causing a glut as soon as the activity in railway building began to diminish.

The expectation that the crops of wheat and corn are to bring immediate prosperity is not warranted by the facts. The export demand is very light and prices low, and the difference between Western receipts and shipments of wheat and flour and the Atlantic receipts, shows that the interior or home consumption is enormous and constantly increasing. This is not surprising in view of the increase in population. A considerable portion of Europe which has heretofore consumed our bread stuffs abroad is now consuming it here. The wheat crop of the present year will not vary materially in quantity from the average of the past three years, but per head of population and mile of railway it is considerably less, thus diminishing the value of the crop per inhabitant. With respect to the corn crop which is yet to be marketed, the outlook, in consequence of its abundance, and little or no demand for export, is not promising.

These considerations seem to be sufficient to show that the prevailing dullness is the effect of very obvious and adequate causes, and that no very decided change for the better can be looked for while the existing conditions continue. An improvement may begin at any time, but when it does begin it is likely to be gradual and permanent instead of spasmodic and transitory.

HEATING AND VENTILATION.

The knotty question as to whether any system for heating and ventilating cars so as to give general satisfaction is possible, and if possible, whether the two should be combined in one system, was discussed by the New England Railroad Club on the evening of the 22d ult. At this present writing we have not seen a report of the discussion. It is a prolific subject, and some interesting and perhaps original views were presented, but we do not think that either branch of the inquiry was definitely settled.

With respect to the various systems, or rather methods, now in use, we are inclined to think that in the main they really do give pretty general satisfaction, otherwise there would be a much louder chorus of complaint than is now heard. The question should be rather, Can the existing methods be improved, or can the best of them be superseded by something better? It is manifest that nothing short of a system that will enable each person in a car to regulate the temperatnre and ventilation to suit himself will be universally acceptable. When it comes to the nice point, hardly any two persons want to be warmed and ventilated precisely alike, and the difficulty is considerably increased when a whole carfull of people of different degrees of physical health and vigor have to be catered for in the matter.

Whether the providing of warmth and pure air should be by separate or combined methods, is as yet an open question. There is, of course, no occasion for any combination except when the natural temperature is too cool for comfort. If a car can be ventilated in winter without discomfort or injury to passengers, by a direct influx of outside air, then it would certainly be better not to warm the air before it comes in contact with people, for the reason that it would then have the requisite quantity of moisture so essential to the throat and lungs. Most people, however, prefer to have the chill taken off a little, and some want it taken off a good deal, moisture or no moisture, because it makes them feel more comfortable. We think, therefore, that in order to give as much general satisfaction as is possible in the nature of the case, the mechanical means by which provision is made for heating and ventilating should be combined to a very considerable extent in the same system or apparatus.

Machinery Unadorned.

Within a few years great changes have taken place in the external appearance of engines and machine tools. Of old the ogee and the "squirlycue" held sway, and branching devices, of one sort or another, played over the front and down the sides of bed-plates and lathe-beds without reason or fitness. These ornaments, so called, were more than useless, for while they were material in the wrong place, they were also convenient receptacles of grease and dirt. Paint and varnish, in the shape of gaudy "decoration," have also disappeared, and the higher-class machines of to-day are of a dull and somber hue, which shows off the bright work to advantage. Aside from this, the plain faces are easily cleaned, affording no lodgment to dust, which is soon turned into a greasy mass by dripping oil. A steamship out of this port has the engine frame painted dead-white all over, from keelson to cylinder-head, and woe be to the man who lays a grimy hand upon it. It would seem impossible to keep a marine engine-frame of such a color spotless; but an inspection of the vessel, just after a six days' trip, proves that it is not, when neatness and care are inculcated. These two virtues, in this instance, are greatly encouraged by the smooth, unbroken surfaces of the frames themselves. Save in a few isolated instances, the modern practice of the best makers is as indicated above; but a barbaric splendor still illuminates—may we say disfigures—some machines. It is not long since that we saw a new engine being shipped, which was an example to be avoided. There is an "art" beloved of maiden ladies termed "potichomanie;" so called, doubtless, from a maniacal desire to cover pots or jars with lithographed designs in all colors and of all subjects. This engine was "potichomanied." In the center of the bed-plate was a staring landscape, and at various intervals along the side of the frame the familiar arabesque curveted and tumbled. A correct taste would have suppressed all this misplaced finery, and substituted instead a solid color that would stand the wear and tear of daily work. An engine with pretty pictures on it is not apt to be overwiped anywhere. —*Mechanical Engineer.*

A Merited Tribute.

Mr. S. H. H. Clark, who recently tendered his resignation as general manager of the Union Pacific, has been presented with the following address by the employés of the road, 300 or 400 of whom gathered at his residence in Omaha to witness the formal presentation:

Respected Sir: To-night you see gathered before you the employés of the Union Pacific Railway, some of whom have served nineteen years, most of them under you in your several positions, as division superintendent, general superintendent, general manager and vice-president of the great Union Pacific system. Your friendly notice announcing that, after eighteen years of unremitting labor in the interests of this company, you felt it imperative on you to sever your official connection with it and with us has been received. We come here to night, sir, to bid you a formal and respectful farewell, and to express our sincere regrets, that the condition of your health renders it impossible for you longer to continue to direct to the measure of your liking the varied interests of this great corporation, which your labors in the past have done so much to build up.

In parting from you, as our honored and respected head and leader for so many years, we wish to give expression to the unanimous and spontaneous feelings of those who have been under your management, that in each and every position you have been called upon to fill you have shown yourself a noble example of a man, true to the trust reposed in you, whether by employer or employé, thoroughly appreciating that capital has its duties and responsibilities as well as its rights, and to your credit be it said that your heart has always beat kindly for the weaker side.

In the name of the employés of the Union Pacific Railway Company we, the committee, would beg leave to bid you a respectful farewell, and we trust that prosperity will attend you and yours in all future relations of life.

Basket Racks in Cars.

The design of a basket rack appears to be a simple thing, and it is safe to say that most of the racks in use have been made with only the idea that they are places into which passengers can put a hat, if they can make it stay there. Generally, the only package which a rack seems fitted to hold is a six-inch bundle not over eighteen inches long. Boxes, hats, drygoods packages, shawls, bonnets or coats, are out of place, and if at last they have been wedged fast or hung up, they are ready to let go and come down at the first heavy lurch of the car on the passenger who was green enough to dream of a rack holding more than one thing at a time. There is always an abundance of room in the rack, but it is of such a shape that it cannot be utilized. No ingenity will enable the passenger to get his bundles in, and so he has to be contented with wedging one or two in cornerwise, while the rest of his belongings are placed on the floor under his feet. A rack made according to the old fashioned plan, in the form of a cylinder with one side partly open, is fit only for very soft parcels that will bear squeezing. These racks are often made a source of great danger by the ornamental work on them, which appears to be designed with the view of impaling people should the car roll over. In its construction, this kind of rack is weak and easily bent or jammed. The ideal rack should have a flat bottom and not a round one. The small parcel will not then of necessity take the middle position, and prevent any other article from being placed beside it. The edges or sides should be turned up a few inches only, barely sufficient to prevent things from sliding off. The corners should be rounded, and the back have a protecting plate or rods to prevent the varnish from being damaged. Whether umbrella rings are worth putting up is very doubtful. They are not used once a day at any season of the year. Hooks are far better than the rings, and would have the advantage of answering several purposes. In most cars, the racks, with a sort of innate depravity, always come over the seats where the sitter has nothing to put in them, leaving the occupant of the intermediate seat, who may happen to be a lady returning from a shopping tour, to reach forward or backward in order to dispose of her parcels and packages.

Master Car-Builders' Club.

At the meeting of the Master Car-Builders' Club in New York, Oct. 16, to make arrangements for the winter season, it was resolved to hold regular meetings on the evening of the third Thursday in each month, as heretofore, at the rooms No. 113 Liberty street. The following subjects were agreed upon for special discussion at each meeting:

November: Safety Couplers for Freight Cars.

December: Car Wheels.

January: Heating, Lighting and Ventilating Passenger Cars, including Safety Hatches in Car Roofs.

February: Standard Car Body and Trucks for Freight Service.

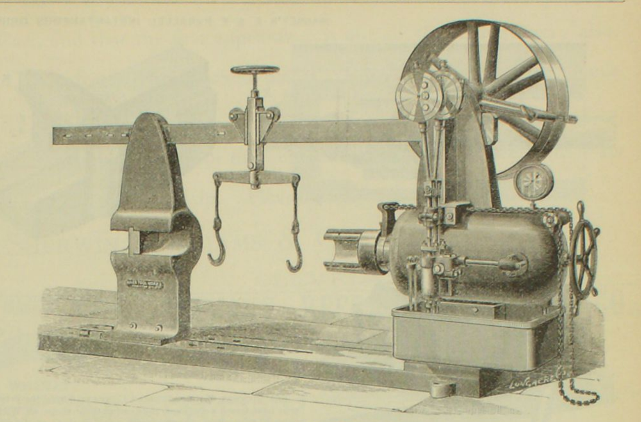
March: The Present Condition of Cars offered for Interchange of Traffic.

The April meeting is left open for discussion of any subject which may arise.

All railroad men and others interested in the subjects which are to be discussed are invited to attend these meetings.

A COMMITTEE, says the *Railway World*, was appointed at the last meeting of the National Association of General Passenger and Ticket Agents for the purpose of investigating the alteration of tickets by chemicals. They have prepared a report which states that all the ordinary writing inks can readily be removed from tickets and ordinary writing paper by well-known chemicals, without leaving any evidence of such removal, but that an ink called "Kosmian Safety" has been invented which cannot be removed or even bleached. The committee, therefore, recommend its use by railroad companies in filling out skeleton tickets, orders, etc., that are liable to alteration after issue. The only other available protection against forgery and fraud appears to be "safety paper, from which the committee states that ordinary writing ink can also be effaced, but only by discoloring the paper."

IN the article on "Painting Passenger Cars Piecemeal," which appeared in our last issue, Mr. Murphy, of the firm of Murphy & Co., of Newark, N. J., was credited with suggesting this mode of painting at the recent meeting of the Car Painters' Association. This is an error. The suggestion was made by Mr. Joseph Murphy, of the Louisville & Nashville road. Mr. Murphy of Newark was not present at the meeting, and is not a member of the Association.



IMPROVED HYDROSTATIC PRESS

for Pressing on Car and Locomotive Wheels.

We illustrate herewith a new and improved hydrostatic press, for pressing on car wheels and locomotive drivers. The new feature in this machine is the method of operating the pumps, an improvement which has recently been patented by the Niles Tool Works.

As will be seen from the cut, two plungers are employed; one of these is 2 in. diameter, the other 1 in. They are driven from the same shaft, and the plungers are brought into service or thrown out by means of the two rods shown to the right of the pump. When commencing operations both rods are raised about an inch, and immediately both plungers come into play, filling the cylinder and bringing the ram forward quickly. As the pressure commences to rise the rod connecting with the larger plunger is dropped, and immediately that plunger ceases operation. The small plunger then continues the operation until the wheel is forced on the axle and to the position desired. Then the other rod is dropped and this plunger ceases operation instantly.

These rods are attached by means of weighted levers to the suction valves of the pumps. When the rods are down the suction valves are raised off their seats, and hence the plungers are thrown out of service. The operation of starting and stopping is performed instantly; the machine does not make a single effective stroke after the rod is dropped. The whole operation requires no effort whatever on the part of the operator, and can be performed while he stands in position to see the entire operation of the machine.

This improvement is of great advantage in these machines, facilitating operation and preventing the forcing of the wheel too far on the axle, as it can be stopped instantly at any point. It is, therefore, much superior to either shifting the belt or to a valve, which requires considerable effort to open.

These machines are furnished of various sizes, for different diameters of car wheels and locomotive drivers. The machines designed for car wheel work have a capacity of 150 tons on an 8-in. ram, those for locomotive work have a capacity of 200 tons on a 9-in. ram. The cylinder is made of cold blast iron and is carefully copper-lined, the lining being well burnished in. The cylinder is provided with a relief valve, and the ram is weighted so as to return quickly. The machine is set upon a substantial cast-iron base, upon which the resistance post moves on rollers. It is provided with an hydraulic gauge, lock-up safety valve, traveler for carrying the axle, and every attachment to make the machine complete.

These machines are built by the Niles Tool Works, Hamilton Ohio.

Car Spring Testing Machines.

A paragraph was inserted in our last issue, on what we deemed good authority, stating that the Car Spring Testing Machine, illustrated and described in the September CAR-BUILDER, was identical, or nearly so, with a machine of the same class used in England many years ago, and subsequently introduced in this country by Mr. A. W. Robinson, formerly of the Great Western Railway of Canada.

From information since receied we are convinced that the tester illustrated in our September number differs very essentially from the Robinson machine, and is withal a very decided improvement upon it both in construction and operation. The lever principle is of course the same in all appliances of this class, but the application of it can be very much varied. The Robinson tester was a clumsy affair designed only for locomotive single elliptic driving springs. It had no sliding table, the plunger was close to the bed-plate, leaving room for only one spring, and the lever was handled by a block and tackle swung from the ceiling, and from three or more men were required to operate the tester. With the improved machine shown in our September number, four coupled elliptics can be tested, and in lieu of a block and tackle, a guide bar is attached to the floor with graduating holes for pins to hold the lever at any height, with whatever weight is required on it, thus relieving the spring by lowering the jack. The tester can also be operated easily by one man.

MR. W. E. PHILLIPS, late Master Mechanic of the Texas & St. Louis road, has taken charge of the shops of the American Brake Co., at St. Louis.

MASSEY'S E & K PARALLEL INSTANTANEOUS GRIP VISES.

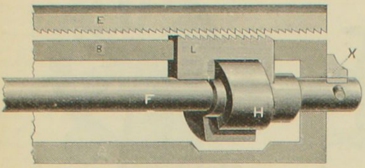


Fig. 1.

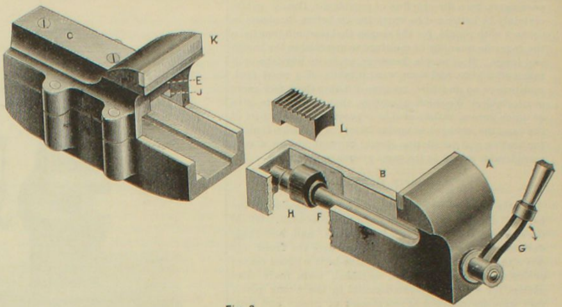


Fig. 2.

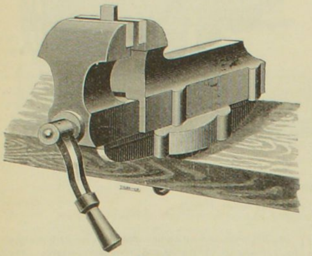


Fig. 3.

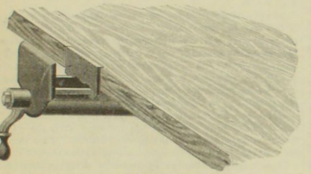


Fig. 4.

These vises have all the characteristic advantages of the screw, together with that of an instantaneous grip for any size of work between the jaws with less than half a turn of the handle. For instance, a piece of work an inch thick can be gripped and released, an eight-inch piece substituted and tightly gripped, without releasing the vise handle or turning it more than half a revolution. The jaw is moved in or out with one hand, leaving the other free to handle the work, or when both hands are needed for holding the work the jaw can be pushed up by a slight motion of the body, and the work can be gripped by the dropping of the handle downward to the right. This will be sufficient to hold the work and release one of the hands to tighten the hold.

Fig. 1 is a section of the vise showing the parts out of gear, and Fig. 2 represents the movable parts detached. *F* is the shaft to which the handle *G* is secured at its front end; *H* is a scroll or spiral cam upon which rides the block *L*, which has flanges which embrace the cam, and also upon the upper side a series of teeth which fit into and engage the teeth in the long rack *E*, which is embedded in the cap piece *C*. On the under side of this cap piece is a slot *J*, which holds the block *L* in position and keeps the teeth at all times parallel. The hand lever *G* controls the cam *H* through the spindle *F*, causing the block *L* to move into or out of contact with the long rack. When the teeth are disengaged, the loose jaw can be slid in or out to the required width for the work, and then by turning the handle from left to right in the direction of the arrow, Fig. 2, the cam will first raise the block *L* into contact with the rack *E*, after which the scroll or spiral portion of the cam *H* will draw the loose jaw *A* up, and secure the work firmly between the two jaws. A stop *X*, Fig. 1, is placed upon the end of the bar *B*, in order to limit the throw of the hand-lever and consequent movement of the spindle. The construction of the rack and teeth of the block is such that they always come into gear in any position. The scroll of the cam draws the block up the inclined side of the teeth and moves it forward at the same time.

Fig. 3 represents a vise adapted to the wants of railroads, machine shops, and of brass and metal workers generally. Figs. 4 and 5 are car-builders' vises.

The working parts of all these vises are of steel, and all the parts are interchangeable. They are manufactured by Thomas C. Massey, South Jefferson street, Chicago, Ill. The Eastern agents are the Link Belt Machinery Co., 81 John street, New York.

GEORGE WESTINGHOUSE, the inventor of the air-brake, is at work upon a burner which will make practicable the use of natural gas as an illuminant as well as a fuel.

IN accordance with the constitution of the Master Mechanics' Association, the first vice-president, Mr. I. Davis Barnett, succeeds the late president, J. H. Flynn, deceased. The supervisory committee, in making the announcement, requests that all communications intended for the new president be addressed to him at Port Hope, Ontario.

THE DICKSON MANUFACTURING COMPANY during the present year have issued a catalogue illustrating their shops at Wilkesbarre and Scranton, together with some of their work, which contains some features of special interest to boiler users, and especially to locomotive builders. One portion of their plant consists of a special hydraulic flange press, in which the plate is flanged at one uniform and moderate heat, and is turned at once evenly all the way round.

In their catalogue they devote six pages to illustrating flue-sheets, back-heads and fire-box end-sheets for locomotives. These illustrations are accompanied by dimensions which are so varied as to make it seem possible for almost any builder to find patterns and sizes suitable for his work. With plates furnished, the work of flanging is very much less than with all hand labor, and, as the dies for flanging any size or particular shape are comparatively cheap, it would pay a superintendent, even on a small order, to have dies made for his especial service. A great many sizes of ordinary stationary boilers, as well as many varieties, are illustrated and particulars of them given. One of the marked features of the boiler plants used in the coal region is the application of blowers to use and force draughts. These are of peculiar patterns, delivering air in large quantities into the ash-pits, and making it possible to burn a quantity of fuel, which, under ordinary circumstances, would be considered useless. The catalogue is one which the master mechanic or car-builder will look over with interest, and carefully file away for future reference.

THE CINCINNATI CORRUGATING CO. have furnished 210,000 feet of their corrugated iron roofing for the Pennsylvania State Agricultural Society's Exhibition buildings, at Philadelphia. The buildings comprise a number of cattle sheds and structures for other purposes, in the erection of which 1,200,000 feet of lumber were used.

FOR the sixth time, Bradley's cushioned helve-hammers, manufactured by Bradley & Co., Syracuse, N. Y., have taken the highest award (the grand silver medal) at the Cincinnati Exposition. They have never been exhibited without taking the highest prize.

Mr. H. B. LA RUE has resigned his position as traveling agent of the Brooks Locomotive Works, in order to devote his entire attention to the increasing business of the Midvale Steel Co., and is succeeded by Mr. R. J. Gross.

T. C. MASSEY, manufacturer of Massey's "E. & K." patent vises, has moved his manufactory from Batavia, Ill., to 11-23 Jefferson street, Chicago.

Rocking Grate Bar Test.

A comparative daily working test during the past two weeks, made by the Chicago Sugar Refining Co., owners of the largest steam plant within the limits of Chicago, to ascertain the difference between the ordinary grates they have in use and those they bought of us, has resulted in showing the very surprising gain of 33⅓ per cent. in fuel, and at the same time raising the boiler capacity nearly 25 per cent. The test was made in the way of regular business on two boilers of 175 h. p. each, both fired by one of the regular firemen of the establishment, the water measured by Worthington water meters, and the coal taken from the same pile, it being the Illinois coal ordinarily used by that company, and from the regular supply.

The foregoing test was made with scrupulous care, and was conducted by the Chicago Sugar Refining Co., entirely controlled and watched by men appointed by them for that purpose.

The details of which, as taken from the records of the company, will be forwarded on application.

Sept. 23, 1884. ROCKING GRATE-BAR CO., Chicago.

The Ajax Metal Co.

The partnership existing between J. G. Hendrickson, F. J. Clamer and Frank Bushnell is this day dissolved by mutual consent. Either J. G. Hendrickson or F. G. Clamer will sign in liquidating the debts of said firm, and all moneys due the Company will be made payable to their order.

J. G. HENDRICKSON,
F. J. CLAMER,
FRANK BUSHNELL.

The Ajax Metal Co. will be incorporated and reorganized under the laws of the State of Pennsylvania. All orders for "Ajax Metal" will have prompt attention.

J. G. HENDRICKSON,
F. J. CLAMER.

PHILADELPHIA, October 27, 1884.

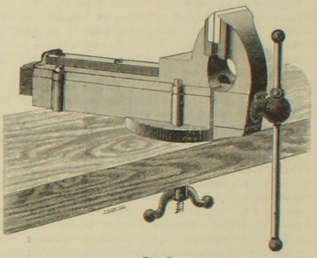


Fig. 5.

To remove blueing from steel, immerse in a pickle composed of equal parts muriatic acid and elixir vitriol. Rinse in pure water and dry in tissue paper.

Our Directory.

We note the following changes since our last issue. Our readers will do us a great favor by giving us prompt notice of any changes that may come to their knowledge or of any errors that may be noticed in our list:

Chicago & Atlantic.—Chas. J. Domville has been appointed Master Mechanic in place of G. A. Hill, resigned.

Chicago & West Michigan.—J. K. V. Agnew has been appointed Assistant General Superintendent.

Flint & Pere Marquette.—H. M. Perry has been appointed Master Car-Builder; in full charge of the car department of this road, in place of R. McPherson, resigned. Mr. Perry has for some time been Superintendent of the Muskegon Car & Engine Co.

Hannibal & St. Joseph.—Norman Paradise has been appointed Master Mechanic in place of James H. Long, resigned. Thos. Johnson has been appointed General Foreman of the Hannibal shops.

Louisville, New Orleans & Texas.—E. Anderson has been appointed Master Mechanic.

Old Colony.—C. Berkley Powell has resigned his position as Master Mechanic of this road, and has gone to California.

St. Louis & Cairo.—T. W. Lewis has been appointed Master Mechanic, with office at East St. Louis.

St. Louis & San Francisco.—A. T. Mann, Jr., has been appointed Purchasing Agent in place of A. G. Thompson, resigned.

St. Paul & Duluth.—Chas. F. Ward has assumed the duties of Master Car Builder in place of John Hill, resigned.

Union Pacific.—J. O. Brinkerhoff has been appointed Superintendent of the Kansas Central Branch.

Wabash, St. Louis & Pacific.—U. H. Kohler has resigned his position as General Master Car Builder.

Western & Atlantic.—Lamar Collier has been appointed Master Mechanic (succeeding J. H. Flynn, deceased) and Wm. Kinyon Master Car Builder.

An Interesting Bill of Particulars.

The following is a true copy of a bill furnished by a Mr. Jones to the Rev. J. Squire, for repairs done to a Catholic chapel in Yorkshire, Eng., Nov. 5, 1650. The original bill was found among some old papers in a chapel in the county of Surrey:

To solidly repairing St. Joseph	4d.
" cleaning the Holy Ghost	6d.
" repairing the Virgin Mary, before and behind, and making her a new baby child	5s. 6d.
" turning a new nose for the Devil, and putting a new horn on his head, and gluing a piece on his tail	4s. 6d.
" putting a new proboscis on His Reverence the Pope, and letting in a piece behind	1s. 6d.
	12s. 4d.

Employment.

WANTED—A position as Master Car-Builder on a railroad, or as Superintendent or Foreman in a contract shop. The applicant has had fifteen years' experience as a master car-builder on one of the leading roads of the country. Address "Como," office of NATIONAL CAR-BUILDER.

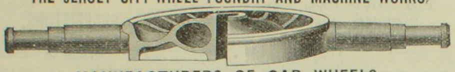
The best Railroad Managers and Car Builders are realizing more than formerly the economy of thoroughly painting Freight Cars, and that the first appearance is not all that is required; also, that cheap ready-made paints and imperfectly (hand) mixed paints are as a rule not durable, hence not economical.

We respectfully call the attention of all interested in this subject to the "Perfect Method." Its many real advantages we have not space here to explain. Please send for Description.

SHERWIN, WILLIAMS & CO.

CLEVELAND & CHICAGO.

THE JERSEY CITY WHEEL FOUNDRY AND MACHINE WORKS.



MANUFACTURERS OF CAR WHEELS.
P. O. Box 129, Jersey City, N. J.

TIFFANY REFRIGERATOR CAR CO.,
164 DEARBORN ST., CHICAGO, ILL.
1,500 in Use.

JOHN W. MASURY & SON,
MAKERS OF STRICTLY FIRST-CLASS
Railway Varnishes,
AND MANUFACTURERS OF
CAR BODY COLORS.

By permission, we refer to the following Companies, for whom we have made Special Colors:

PENNSYLVANIA RAILROAD CO., Enoch Lewis, Purchasing Agent, Philadelphia, Pa.
PENNSYLVANIA CO., Wm. Mullins, General Purchasing Agent, Pittsburg, Pa.
BALTIMORE & OHIO RAILROAD CO., N. S. Hill, Purchasing Agent, Baltimore Md.
CHICAGO & ALTON RAILROAD CO., A. V. Hartwell, Purchasing Agent, Chicago, Ill.
CHICAGO & NORTHWESTERN RAILROAD CO., R. W. Hamer, Purchasing Agent, Chicago, Ill.
LEHIGH VALLEY RAILROAD CO., L. Chamberlin, Purchasing Agent, Philadelphia, Pa.
NORTHERN RAILROAD OF CANADA, F. W. Cumberland, Superintendent, Toronto, Ont.
NAUGATUCK RAILROAD CO., G. W. Beach, Superintendent, Waterbury, Conn.
PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD CO., S. A. Hodgman, Superintendent of Motive Power, Wilmington, Del.
NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO., R. N. Dowd, Commissary, New Haven, Conn.
UNION PACIFIC RAILROAD CO., } A. D. Clark, Purchasing Agent, Omaha, Neb.
KANSAS " " " }
CHICAGO, BURLINGTON & QUINCY RAILROAD CO., Wm. Irving, Purchasing Agent Chicago, Ill.
LOUISVILLE, CINCINNATI & LEXINGTON RAILROAD CO., Wm. Mahl, Purchasing Agent, Louisville, Ky
GRAND TRUNK RAILWAY N. Wall, Port Huron, Mich.
LITTLE ROCK & FORT SMITH RAILROAD CO., T. Hartman, Purchasing Agent, Little Rock, Ark.
GILBERT & BUSH CO., Troy, N. Y.
WASON MANUFACTURING CO., Brightwood, Mass.
BILLMEYER & SMALL MANUFACTURING CO., York, Pa. } Railroad Car Builders.
JACKSON & SHARP CO., Wilminton, Del.
BARNEY & SMITH MANUFACTURING CO., Dayton, O.

The advantages derived from the use of such Special Colors are many, a few of which are found below:

ABSOLUTE UNIFORMITY OF SHADE. DURABILITY, as we use perfectly pure materials. **SAVING OF MONEY,** because of small quantity required. **SAVING OF TIME,** in the putting on of the same. **SAVING OF LABOR AND MATERIAL,** as no extra amount of Varnish will be required to hide a sanded surface **LARGER DEGREE OF CERTAINTY** that there will be an absence of cracked work, as our mixtures are all uniform, being done by weight only.

We make any desired shade, it only being necessary that purchasers furnish us with sample of color desired, stating the time they would like to have the paint dry in.

We shall be glad to furnish samples and give prices to any who may wish to avail themselves of the above advantages.

Very respectfully

JOHN W. MASURY & SON, New York and Chicago.

Established 1856.

Shipman & Bolen, Mfrs. of fine
Railway Varnishes.
Our Varnishes excel in durability,
Newark, New Jersey.

BILLINGS, TAYLOR & CO.,
(INCORPORATED.)
Color Makers,
AND MANUFACTURERS OF
COACH AND CAR COLORS AND FINE VARNISHES.
N. Y. Office, 16 Platt Street. CLEVELAND, OHIO.

MALLEABLE IRON CASTINGS
AIR FURNACE
IRON
SEAT-ENDS,
SLEEVE NUTS,
JOURNAL WEDGES,
OIL-BOX COVERS,
SEAT-BACK ARMS,
Fr't Car Fastenings,
DRAW-BARS,
Etc.,
TO ORDER
DAYTON MALLEABLE IRON CO. DAYTON, O.

THE MANN BOUDOIR CAR.

PRIVACY, LUXURY, COMFORT,
PERFECT VENTILATION.

Run regularly every night between
NEW YORK AND BOSTON (Via Springfield).
Leave New York 10:30 P. M.
" Boston 10:30 P. M.
On the express trains.

These cars also make regular night service between CHICAGO AND DETROIT, over the "Niagara Falls Short Line" (Wabash and Baltimore & Ohio Ry's.)

TIME TABLE.

Leave Chicago 8:45 P. M. Arrive Detroit 6:00 A. M.
" Detroit 9:40 " " Chicago 8:38 "
Between CHICAGO AND ST. LOUIS, over the W., St. L. & P. Ry.
Leave Chicago daily 9:05 P. M. Arrive St. Louis 8:00 A. M.
" St. Louis " 8:00 " " Chicago 7:25 "
And between ST. LOUIS AND KANSAS CITY, over the W., St. L. & P. Ry.
Leave St. Louis daily 8:25 P. M. Arrive Kansas City 8:20 A. M.
" Kansas City " 7:20 " " St. Louis 7:00 "

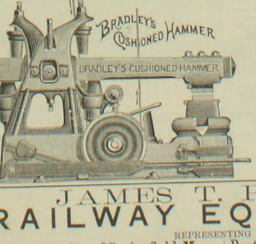
Mann's Boudoir Car Co. is now prepared to negotiate with railroad companies for placing its cars in regular service on their roads.

PRIVATE CARS.

The cars "Adelina Patti" and "Etelka Gerster," undoubtedly the most magnificent private cars in the world, are TO LET for long or short trips. They are provided with attendants, silver, table and bed linen complete. For further particulars and explanatory books apply to

MANN'S BOUDOIR CAR CO.,
DUNCAN BUILDING, 11 PINE STREET, NEW YORK.

BRADLEY'S CUSHIONED HAMMER



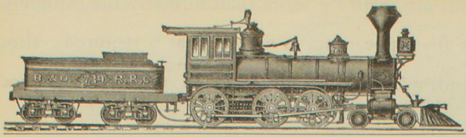
STANDS TO-DAY
WITHOUT AN EQUAL.
OVER 800 IN USE.

It approaches nearer the action of the smith's arm than any hammer in the world.

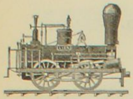
BRADLEY & CO.,
Syracuse, - - N. Y.
(Established 1832.)

Heating Forges for Hard Coal or Coke.

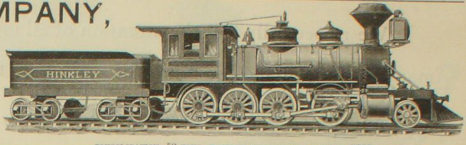
JAMES T. PATTEN,
RAILWAY EQUIPMENT.
REPRESENTING THE
Wason Mfg. Co., of Springfield, Mass. | Portland Company, of Portland, Me.
RAILWAY CARS, ETC. | LOCOMOTIVES.
18 BROADWAY (Welles Building), NEW YORK



PITTSBURGH LOCOMOTIVE AND CAR WORKS,
PITTSBURGH, PA.
MANUFACTURERS OF
Locomotive Engines for Broad or Narrow Gauge Roads,
From standard designs, or according to specifications, to suit purchasers.
Tanks, Locomotive or Stationary Boilers Furnished at Short Notice
D. A. Stewart, Prest. D. A. Wightman, Supt. Wilson Miller, Sec. & Treas.

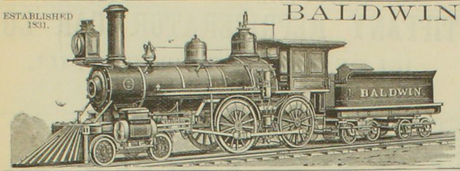


LION, 10 TONS, HINKLEY, 1839.



CONSOLIDATION, 52 TONS, HINKLEY LOCOMOTIVE COMPANY, 1882.

HINKLEY LOCOMOTIVE COMPANY,
BOSTON, MASS.,
MANUFACTURERS OF
LOCOMOTIVE ENGINES
FOR ALL GAUGES.
Best workmanship and interchangeability of parts guaranteed.
GREELY S. CURTIS, Treas. FRANKLIN D. CHILD, Supt.



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BURNHAM, PARRY, WILLIAMS & CO., PROPRIETORS,
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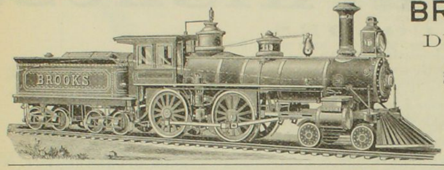
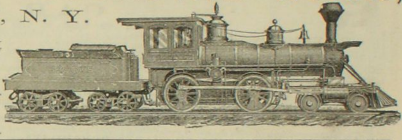
MANUFACTURERS OF
LOCOMOTIVE ENGINES, CAPACITY 600.
Adapted to every variety of service, and built accurately to standard gauges and templates. Like parts o different engines of same class perfectly interchangeable.
Passenger and Freight Locomotives, Mine Locomotives, Narrow Gauge Locomotives, Steam Street Cars, etc.
Illustrated Catalogues furnished on application of customers. All work thoroughly guaranteed.





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Orders Solicited for Locomotives Adapted for Every Class of Railway Service.
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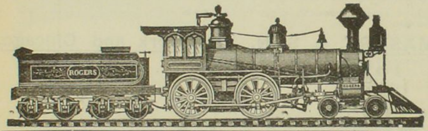

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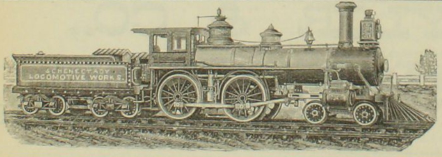

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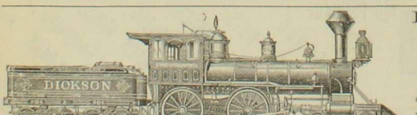
SCHENECTADY, N. Y.



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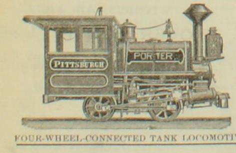
Scranton and Wilkes-Barre, Pa.,
MANUFACTURERS OF
LOCOMOTIVES FOR EVERY KIND OF SERVICE.
The different classes constructed according to standard gauges and templets, so that like parts are interchangeable and may be ordered by number.
MINING, HOISTING and PUMPING MACHINERY a specialty. Car Wheels, Forgings, and Machinery of all kinds. Specifications and plans furnished on application. General Office, Scranton, Pa.
H. M. BOIES, President. JAS. P. DICKSON, Vice-President. WM. H. PERKINS, Sec'y and Treas.
E. D. LEAVITT, Jr., M. E., Cambridgeport, Mass., Consulting Engineer.



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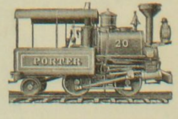
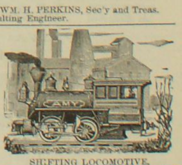
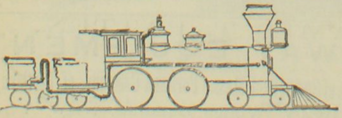


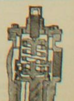
LOGGING LOCOMOTIVE



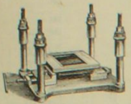
SHIFTING LOCOMOTIVE.

H. K. PORTER & CO.,
PITTSBURGH PA.
Builders of all Kinds of
LIGHT
Locomotives.
Send for Catalogue.





THE ASHTON VALVE COMPANY,
271 Franklin Street, Boston, Mass.
The Ashton Blow-back Safety-valve is constructed so as to conduct the escape steam which is blown off back to the tender, or to the smoke-box and up the chimney. By this arrangement the heat of the escape steam, instead of being wasted as it is when an ordinary safety-valve blows off, is communicated to the cold water in the tender. This not only results in an important economy, but it renders the escaping steam noiseless, and the increase of temperature of the water has a tendency to deposit some of its impurities before it is pumped into the boiler. It thus *stops the noise! saves fuel! and all engines steam better and faster, and do more effective work with these valves* than with those in ordinary use.



PATENT PORTABLE

VALVE CHUCK.

Combination Tool to be used with our Valve Seat Rotary Planin Machine for planing valves of locomotives.

SEND FOR CIRCULAR.

L. B. FLANDERS MACHINE WORKS,
PEDRICK & AYER, Proprietors,
PHILADELPHIA, PA.

NON-INFLAMMABLE
TRADE **Elastic Fiberized Packing** MARK
FOR JOURNAL BOXES.
PATENTED 1884.

Nine pounds of our *Packing* takes the place of *fifteen* pounds of cotton or wool waste, giving *perfect lubrication* and showing a large *saving in oil.*

Particular attention is called to the *elasticity* of our *Packing*, which causes it to *hold up* to the journal and prevents it from sagging when saturated with oil, thus proving it *superior* to any *Packing* ever introduced.

THE ELASTIC PACKING MFG. CO.,
JERSEY CITY NEW JERSEY.

TRADE MARKS: "*Phosphor-Bronze.*"

PHOSPHOR-BRONZE,

For Bearings of Locomotives, Cars and Machinery,
SLIDE VALVES, CYLINDER RINGS AND STEAM CONNECTIONS.
SAVES OIL AND REPAIRS, PREVENTS DELAY TO TRAINS, AND NEVER CUTS THE JOURNALS.
Pamphlets and particulars on application to
THE PHOSPHOR-BRONZE SMELTING CO., Limited,
Office, 512 Arch Street, Philadelphia, Pa.
Owners of the United States Phosphor-Bronze Patents. Sole Manufacturers of Phosphor-Bronze in the United States.

Phosphor
Bronze

THE HENRY-BELL PAINT REMOVER!

FULLY TESTED.

Time, Money and Danger Saved to Railroads and Coach Painters.

For removing old Paint or Varnish from Woodwork, Iron, Glass, etc., *without the use of Fire, Hot Irons, or Scrapers.* Does its work *neat, cheap and rapid. Does not raise the grain of the wood or injure the fabric operated upon. Does its work in less than an hour, 60 minutes.* Can be repainted at once as nicely and effectually as when originally primed. Does away with the use of *Fire, Hot Irons or Scrapers.* Does not injure the workman. Applied with an ordinary paint brush upon any surface which can be painted. Will not run. After old paint is softened it is easily removed by water. One gallon of compound will remove all the paint or varnish on a square (10 × 10 feet). Price list sent on application. Reasonable discount to the trade. Orders, correspondence and tests solicited. Manufactured and sold only by

BELL & HENRY, Platteville, Wisconsin, U. S. A.

TO STEAM USERS.

I will Remove and Prevent Scale in any Steam Boiler, or make no charge. My Remedy will also Neutralize the most destructive waters, and prevent

GROOVING, PITTING AND WASTING OF IRON,
Which causes so many Boiler Explosions.

A BOOK ON CARE AND MANAGEMENT OF BOILERS FREE.

Address **GEO. W. LORD, 316 Union Street, PHILADELPHIA, PA**

LINDSAY, PARVIN & CO.,
Successors to Lloyd & Lindsay,
328 WALNUT STREET, PHILADELPHIA.

Rolling Stock New and Second Hand.

Steel Rails and Fastenings. General Line Equipments.
Iron Ship and Bridge Building Materials.
Steel Boiler, Bridge and Ship Plates. Angles and Beams.

DAMASCUS BRONZE,

Formerly Manufactured by the WESTINGHOUSE MACHINE CO., now made exclusively by the Damascus Bronze Company for BEARINGS for Locomotives, Cars and Machinery.

We would call the attention of Master Mechanics and Master Car-Builders to our

PEERLESS BEARING METAL,

Claiming it to have more Anti-Friction qualities and to be more durable than any Bronze or Brass on the Market.

The Metal is for Sale Either in Ingot or Castings.

DAMASCUS BRONZE COMPANY, PITTSBURGH, PA.

FULTON IRON AND ENGINE WORKS,
DETROIT, MICH.

HOPKINS' LEAD LINED BEARINGS

CLAMER'S AJAX JOURNAL METAL.
FULTON'S SPECIAL BRONZE BOXES, FOR PASSENGER CARS.
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BOILER HEADS AND FLUE HOLES FLANGED TO ORDER.
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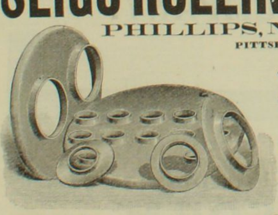

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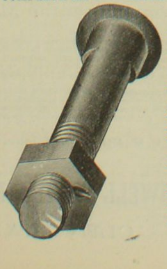

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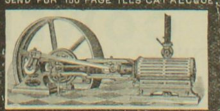

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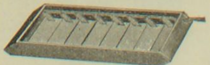

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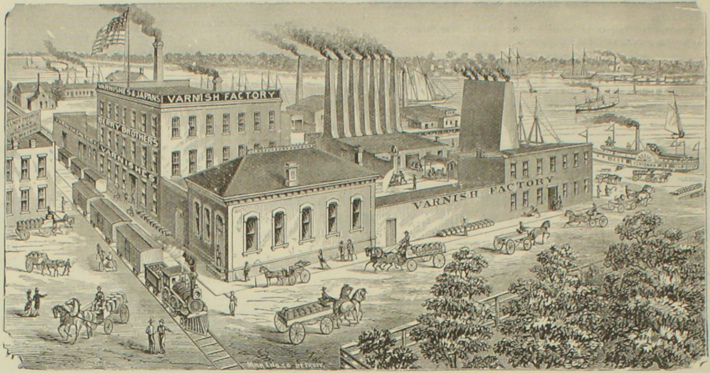

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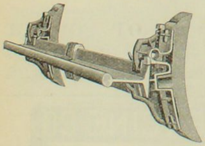

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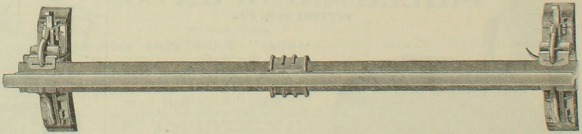

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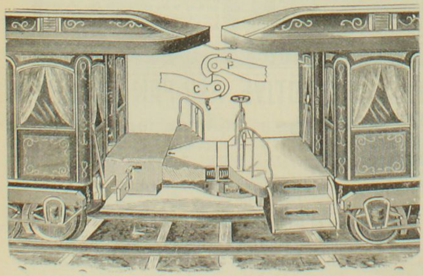
Is the only device forming **A CONTINUOUS FLOOR** between cars in motion, and **PREVENTING JERKING** in starting and stopping trains.



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Is an Improvement on the Miller and Works with it.

"Entire Satisfaction"—"Perfect Satisfaction" are the words used by R. F. Smith, Gen'l Manager Cleveland & Pittsburgh R. R.; Hiram Fowler, Supt. Connecticut Valley R. R.; J. W. Thomas, Gen'l Supt. Nashville, Chattanooga & St. Louis Ry.; J. G. Sawyer, Master Car-Builder same road, and many others.

"The most practical and perfect device in use"—S. L. Bell, an old Conductor Western & Atlantic R. R.; G. R. Carr, Gen'l Sup't Columbus, Hocking Valley & Toledo R. R.; J. W. Babcock, for years conductor N. Y., Pa. & Ohio Ry.; Gen P. Pease, of Ohio Central Railway.

"Saving much annoyance to passengers"—Chas. B. Couch, Div. Sup't Lake Shore & M. S. Ry., and others.

"A great improvement over any other device I have seen"—J. H. Tinney, Sup't N. Y. & Greenwood Lake Railway.

"A great improvement over any other device I have seen," say Messrs. Babcock, Bell, Couch, Thomas, Tinney and others.

"It prevents jerking in starting and stopping trains," say Messrs. Babcock, Bell, Couch, Thomas, Tinney and others.

"A great saving to railroads," say Messrs. Smith, Thomas, Tinney, Fowler, Bell, Babcock, and others.

Refer to the Flint & P. M., Utica I. & Elmira, Cin. Southern, C., N. O. & T. Pacific, W. & A., etc., etc.

THE COWELL PLATFORM & COUPLING CO.,

CLEVELAND, O.

DIRECTORY

of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments.

A

Adirondack R. R. 4-8½ gauge 60 m. 3 lo. 62 cars.
C. E. Durkee, *Supt* ...... Saratoga, N. Y.
Jacob Myers, *M. M* ...... Saratoga, N. Y.
Jas. J. Traver, *M. C. B* ...... Saratoga, N. Y.
Addison & Northern Penn'a Ry. 3 g. 46 m. 5 lo. 50 c.
F. M. Baker, *Gen. Supt* ...... Addison, N. Y.
Alabama Great So'n R. R. (*See Cin., N. O. & T. P.*)
Albany & Susquehanna R. R. (*See D. & H. Canal Co.*)
Albemarle & Raleigh R. R. 4-8½ g. 33 m. 3 lo. 35 c.
Jas. H. Petty, *Gen. Supt* ...... Tarboro, N. C.
Albert Ry. 4-8½ g. 51 m. 3 lo. 35 cars.
G. A. Robinson, *Man. & Pur. Agt.* Hillsboro, N. B.
Jas. McKay, *M. M. & C. B* ...... Hillsboro, N. B.
Alexandria & Fredericksburg Ry. } *See Penna. R. R.;*
Alexandria & Washington R. R. } (7) *Div.*
Allegheny Valley R. R. 4-9 g. 259 m. 70 lo. 2202 c.
David McCargo, *Gen. Supt. & Pur. Agt.*; and
C. B. Price, *Supt.* (Riv. Div.) ...... Pittsburg, Pa.
A. A. Jackson, *Supt.* (L. G. Div.). Reynoldsville, Pa.
W. A. Wood, *M. M* ...... Verona, Pa.
R. Gunning, *M. C. B* ...... Verona, Pa.
Alliance, Niles & Ashtabula R. R. (*See Penna. Co.*)
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, *Supt. & Pur. Agt.* .. Annapolis, Md.
John L. Beall, *M. Mach* ...... Annapolis, Md.
Anniston & Atlantic R. R. 3 g. 9 m.
H. L. Roberts, *Supt.* ...... Anniston, Ala.
Antwerp & Paulding R. R. 4-8½ g. 6 m. 4 lo. 63 c.
E. C. Munson, *Gen. Man* ...... Antwerp, O.
William Fitzsimmons, Jr., *Pur. Agt.* Antwerp, O.
Arizona & New Mexico Ry. 3 g. 71 m. 3 l. 60 cars.
W. H. Jones, *Gen. Supt. & P. A.* Lordsburg, N. M.
W. C. Boylan, *M. M. & M. C. B.* Lordsburg, N. M.
Arkansas Midland R. R. 3-6 g. 63 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man* ... Helena, Ark.
J. B. Johnson, *M. M. & M. C. B* ... Helena, Ark.
Arkansas & Louisiana Ry. 4-8½ g. 16 m.
J. A. Beardsley, *Gen. Supt* ... Washington, Ark.
Asheville & Spartanburg R. R. 5 g. 49 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt.* .. Spart'b'g, S. C.
M. M ...... Spartanburg, S. C.
W. B. Brown, *M. C. B* ...... Spartanburg, S. C.
Ashland Coal & Iron Ry. 4-8½ g. 22 m. 7 lo. 432 c.
Douglas Putnam, Jr., *Gen. Supt.* Ashland, Ky.
Robt. Peebles, *Pur. Agt* ...... Ashland, Ky.
E. M. Roberts, *M. M* ...... Ashland, Ky.
Ashtabula & Pittsburgh Ry. (*See Penna. Co.*)
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 2,620 m. 348 lo. 9,629 cars.
A. A. Robinson, *Gen. Man* ...... Topeka, Kan.
Geo. B. Harris, *Asst. Gen. Man* ... Topeka, Kan.
Geo. Hackney, *Supt. Mach* ...... Topeka, Kan.
Clem. Hackney, *Asst. Sup. Mach. Dept.* do.
Geo. Hargraves, *Pur. Agt* ...... Topeka, Kan.
Eastern Div.: D. J. Chase, *Supt.* .... Topeka, Kan.
Henry Hull, *G. F. Car Dept* ..... Topeka, Kan.
John Fagan, *M. M* ...... Atchison, Kan.
J. M. Smith, *M. M* ...... Kansas City, Mo.
Alfred Taylor, *M. M* ...... Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt.* Nickerson, Kan.
W. Y. Johnson, *M. M* ...... Nickerson, Kan.
...... Dodge, Kan.
W. Div.: C. M. Rathburn, *Supt* ..... La Junta, Col.
A. C. Stiles, *M. M* ...... La Junta, Col.
D. H. Dotterer, *M. M* ...... Raton, N. M.
Las Vegas Div.: Chas. Dyer, *Supt.* Las Vegas, N. M.
F. B. Woodruff, *M. M* ...... Las Vegas, N. M.
J. H. Holman, *M. M* ...... Wallace, N. M.
Rio Gr. Div.: P. F. Barr, *Supt.* San Marcial, N. M.
E. Hackett, *M. M* ...... San Marcial, N. M.
H. P. Olcott, *M. M* ...... Deming, N. M.
Geo. A. Hancock, *M. M* ...... El Paso, Tex.
Sonora Div.: 265 m.
L. H. Waugh, *M. M* ...... Guaymas, Mex.
Kan. Cy., Law. & So. Kan.
4-8½ g. 399 m. 24 lo. 787 c.
J. L. Barnes, *Supt* ...... Lawrence, Kan.
T. D. Volk, *M. M* ...... Ottawa, Kan.
Atlanta & West Point R. R. (*See Western of Ala.*)
Atlantic & Danville Ry. 3 g. 17 m.
E. G. Sweatt, *Gen. Man* ...... Waverly, Va.
Atlantic & North Carolina R. R. (*See Midland; N. C.*)
Atlantic, Tenn. & Ohio R. R. (*See Rich. & Dan.;* (2) *Div.*)
Atlantic & Pacific R. R. 4-8½ g. 575 m.
F. W. Smith, *G. Supt* ...... Albuquerque, N. M.
A. G. Thompson, *Pur. Agt* ...... St. Louis, Mo.
Geo. Chalender, *Supt. M. P. & M.*, and
Geo. F. Chalender, *A. Supt.* Albuquerque, N. M.
Div. Supt ...... Williams, Ariz.
Augusta & Knoxville R. R. (*See Port Royal & Aug.*)
Austin & Northwestern R. R. 3 g. 60 m. 5 lo. 75 c.
J. A. Rhomberg, *Gen. Man* ...... Austin, Tex.

B

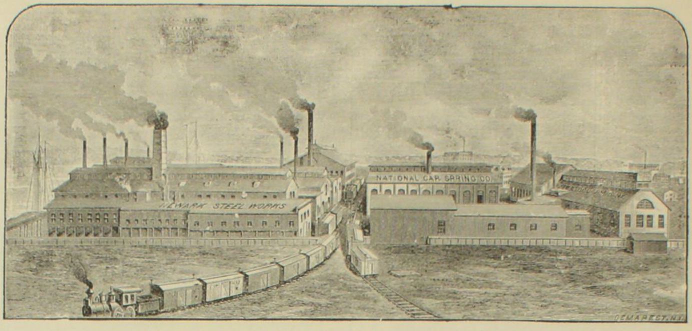
Bachman Valley R. R. (*See Han. Junc., Han. & Gett.*)
Balt. & Delaware Bay R. R. 4-8½ g. 50 m. 2 lo. 13 c.
Fred Gerker, *Gen. M. & P. A.* Chestertown, Md.
Baltimore & Hanover R. R. (*See H. J., H. & G.*)
Baltimore & Ohio R. R.
4-8½ g. 1,612 m. 574 lo. 17,339 cars.
S. Spencer, *2d V. P. & Gen. Man.* Baltimore, Md.
N. S. Hill, *Pur. Agt* ...... Baltimore, Md.
Ohio Riv. Div. 4-8½ g. 972 m.
W. M. Clements, *Mast. Trans.* Baltimore, Md.
A. J. Cromwell, *Act. M. of M.* .. Baltimore, Md.
E. W. Grieves, *Act'g M. C. B.* .. Baltimore, Md.
I. N. Kalbaugh, *M. M* ...... Baltimore, Md.
Wm. Edwards, *M. M* ... Martinsburg, W. Va.
Sam. Houston, *M. M* ...... Piedmont, W. Va.
Robert Maxwell, *M. M* ...... Cumberland, Md.
S. B. Crawford, *M. M* ...... Grafton, W. Va.
Alex. Laird, *M. M* ...... Parkersburg, W. Va.
W. B. McClung, *M. M* ...... Wheeling, W. Va.
Pitts. Div.: T. M. King, *Gen. Supt* ... Pittsburg, Pa.
J. E. Sampsell, *Ast. M. of M.* Connellsville, Pa.
Trans-Ohio Divs.: G. J. Foreacre, *G. Man* Newark, O.
W. H. Harrison, *Asst. M. of Mach* .. Newark, O.
E. L. Weisgerber, *M. M* ...... Newark, O.
H. M. Ingler, *M. M* ...... Bellaire, O.
O. B. Perkins, *M. M* ...... Zanesville, O.
Andrew Beckert, *M. M* ...... Sandusky, O.
F. J. Gunther, *M. M* .... Chicago Junction, O.
Chi. Div.: *Gen. Supt* ... Chicago, Ill.
Benj. Lowther, *M. M* ...... Garrett, Ind.
W. H. Wilkinson, *M. M* ...... Kingston, Ill.
Baltimore & Philadelphia. 4-8½ g. 20 m. 4 lo. 35 c.
D. Connell, *Supt* ...... Wilmington, Del.
Baltimore & Potomac R. R. (*See Penna. R. R.;* (7) *Div.*)
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, *Supt. & Pur. Agt* .. Bangor, Me.
C. S. Nason, *M. M* ...... Bangor, Me.
J. W. Comins, *M. C. B* ...... Oldtown, Me.
Bangor & Portland Ry. 4-8½ g. 25 m. 3 lo. 3 c.
C. Miller, *Pres. & Gen. Man* ... Blairstown, N. J.
Barclay R. R. 4-8½ g. 16 m. 6 l. 200 c.
F. F. Lyon, *Supt* ...... Barclay, Pa.
J. A. Hardenburg, *Pur. Agt* .. 21 Cort. st., N. Y.
Wm. Johnson, *M. M* ...... Towanda, Pa.
Batesville & Brinkley R. R. 3 g. 25 m. 2 lo. 34 c.
R. W. Martin, *Pres* ...... Little Rock, Ark.
W. J. Thompson, *Gen. Man* .. Little Rock, Ark.
E. Summerfield, *Gen. Supt* ...... Brinkley, Ark.
R. B. Davis, *Pur. Agt* ...... Brinkley, Ark.
John White, *M. M* ...... Brinkley, Ark.
Bath & Hammondsport R. R. 3 g. 10 m.
Allen Wood, *Gen. Man* .. Hammondsport, N. Y.
Baton Rouge, Grosse Tête & Opelousas R. R.
5-6 g. 29 m. 3 lo. 12 c.
D. C. Montan, *Gen. Supt* ...... Port Allen, La.
Bedford & Bloomfield Ry. 3 g. 43 m. 5 lo. 65 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.*; and
Capt. Geo. Elliott, *M. M* ...... Bedford, Ind.
Richard G. Elliott, *M. C. B* ...... Bedford, Ind.
Bellaire, Zanesville & Cin. Ry. Co. 3 g. 42 m. 5 lo. 71 c.
S. L. Mooney, *Gen. Supt* ...... Woodsville, O.
J. B. Hong, *M. M* ...... Bellaire, O.
Bell's Gap R. R. 4-9 g. 23 m. 4 lo. 148 cars.
R. G. Ford, *Supt* ...... Bellwood (P. O.), Pa.
Geo. Van Brunt, *M. M* ...... Bellwood, Pa.
A. Zimmerman, *M. C. B* ...... Bellwood, Pa.
Belt R. R. 4-8½ g. 12 m. 10 lo.
W. P. Ijams, *Supt* ...... Indianapolis, Ind.
Bennington & Glastonbury. 4-8 g. 10 m.
R. C. Root, *Pres* ...... Bennington, Vt.
Bennington & Rutland Ry. 4-8½ g. 59 m. 10 lo. 236 c.
F. C. White, *Supt. & Pur. Agt.* .. Bennington, Vt.
G. W. Blanchard, *M. M* ...... Rutland, Vt.
Berlin Branch R. R. (*See Han. Junc., Han. & Gett.*)
Bingham, Canyon & Camp Floyd (*See Den. & Rio Gr.*)
Bladen, Columbus & Florida. 4-8½ g. 16 m. 2 lo. 2 c.
John Colville, *Pres* ...... Wilmington, N. C.
Bod & Benton Ry. 3 g. 34 miles.
Thomas Holt, *Supt. & Pur. Agt* ..... Bodie, Cal.
E. H. Barton, *M. M. & C. B* ...... Bodie, Cal.
Boston, Barre & Gardner. 4-8½ g. 37 m. 8 lo. 108 c.
H. H. Marshall, *Supt. & P. A.* .. Worcester, Mass.
Frank I. Goodwin, *M. M* .... Worcester, Mass.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 87 m. 18 lo. 1,038 cars.
H. L. Morrill, *Gen. Man* .. Mechanicsville, N. Y.
C. H. Cory, *Pur. Agt* ..... Mechanicville, N. Y.
C. H. Cory, *Supt. & M. M* .. Mechanicville, N. Y.
John S. Ellis, *M. C. B* ...... Mechanicville, N. Y.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 7 lo. 46 c.
C. A. Hammond, *Supt. & P. Agt.* Boston, Mass.
R. D. Sutherland, *M. M* ...... Boston, Mass.
John Coghlan, *M. C. B* ...... Boston, Mass.
Boston, Winthrop & Point Shirley R. R.
3 g. 10 m. 1 lo. 8 c.
C. A. Parks, *Supt* ...... Boston, Mass.
J. W. Davis, *M. M* ...... Winthrop, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 245 lo. 6,111 c.
W. H. Barnes, *Gen. Supt* ...... Boston, Mass.
E. Gallup, *Asst. Supt* ...... Springfield, Mass.
A. B. Underhill, *Supt. M. P* ... Springfield, Mass.
F. D. Adams, *Gen. M. C. B* ...... Allston, Mass.
H. B. Chesley, *Div. Supt* ...... Boston, Mass.
G. H. Colby, *Div. M. M* ...... Boston, Mass.
C. E. Grover, *Div. Supt* .... Springfield, Mass.
H. W. Eddy, *Div. M. M* .... Springfield, Mass.
J. B. Weston, *For. Car Sh.* Springfield, Mass.
W. H. Russell, Jr., *Div. Supt.* E. Albany, N. Y.
T. B. Purvis, *Div. M. M* .. East Albany, N. Y.
J. E. Doran, *For. Car Sh* .. East Albany, N. Y.
Boston & Lowell R. R.
4-8½ g. 140 m. 82 lo. 2,565 cars.
C. S. Mellen, *Gen. Supt* ...... Boston, Mass.
F. H. Nourse, *Pur. Agt* ...... Boston, Mass.
Jas. A. Taylor, *Supt. R. S. & M.* Concord, N. H.
So. Div.: J. F. Crockett, *Supt* ...... Boston, Mass.
E. T. Sumner, *M. M* ...... Boston, Mass.
No. Div.: Geo. A. Todd, Supt ... Concord, N. H.
C. C. Aspinwall, *M. M* ...... Concord, N. H.
Wh. Mount Div.: W. A. Stowell, *Supt.* Concord, N. H.
Geo. A. Furguson, *M. M* .. Lake Village, N. H.
Boston & Maine R. R. 4-8½ g. 206 m. 89 lo. 2,209 c.
J. T. Furber, *Gen. Supt. & P. A* .. Boston, Mass.
Geo. J. Fisher, *Pur. Agt* ...... Boston, Mass.
Wm. Smith, *M. M* ...... Boston, Mass.
D. C. Richardson, *M. C. B* ..... Lawrence, Mass.
Boston & N. Y. Air Line R. R. (*See N. Y., N. H. & H.*)
Boston & Providence R. R. 4-8½ g. 67 m. 52 lo. 1,006 c.
A. A. Folsom, *Gen. Supt. & P. A.* Boston, Mass.
Geo. Richards, *M. M* ...... Roxbury, Mass.
Jno. Lightner, *M. C. B* ...... Roxbury, Mass.
Bowling Green R. R. 4-8½ g. 6 m. 2 lo. 4 c.
Wm. A. Wiggins, *Gen. Man.* Bowling Green, O.
Wm. A. Wiggins, *Pur. Agt* .. Bowling Green, O.
Bradford, Bordell & Kinzua R. R. 3 g. 42 m. 6 lo. 82 c.
Bradford, Eldred & Cuba. 3 g. 54 m. 6 l. 158 c.
Tonawanda Valley & Cuba. 3 g. 60 m. 5 lo. 31 c.
B. C. Williams, *Gen. Man. & P. A.* .. Brad'fd, Pa.
Jno. Delaney, *M. M. & C. B* ...... Bradford, Pa.
Brattleboro' & Whitehall R. R. 3 g. 36 m. 3 lo. 56 c.
(*Operated by Central Vermont.*)
Breakwater & Frankford R. R. (*See Del., Md. & Va.*)
Bridgton & Saco River R. R. 2 g. 16 m. 2 lo. 19 c.
Wm. F. Perry, *Gen. Supt* ...... Bridgton, Me.
M. M. Caswell, *M. M. & Pur. Agt.* Bridgton, Me.
Brighthope Ry. 3 g. 37 m. 4 lo. 193 cars.
Jas. R. Worth, *Supt* ...... Richmond, Va.
P. M. Buckingham, *Pur. Agt* Richmond, Va.
A. Gary, *Supt. Way & Works.* Winterpock, Va.
Robt. Kredell, *M. M* ...... Chester, Va.
Brooklyn, Bath & Coney Island R. R.
4-8½ g. 7 m. 8 lo. 36 cars.
Geo. A. Gunther, *Gen. Man* ... Brooklyn, N. Y.
Aug. Wolff, *M. M* ...... Brooklyn, N. Y.
Brooklyn, Flatbush & Coney Island Ry.
4-8½ g. 7 m. 7 lo. 54 c.
J. L. Morrow, *Supt. & P. A* ... Brooklyn, N. Y.
Wm. Finley, *M. M* ...... Brooklyn, N. Y.
Brooklyn & Rockaway Beach R. R.
4-8½ g. 3 m. 2 lo. 18 cars.
Wm. Warner, *Supt* ...... East New York, N. Y.
Brunswick & Western R. R. 5 g. 172 m. 13 lo. 170 c.
H. S. Morse, *Gen. Man. & P. A* .. Brunswick, Ga.
R. J. Evans, *Supt* ...... Brunswick, Ga.
W. R. Kline, *M. M* ...... Brunswick, Ga.
Buff., N. Y. & Phil. R. R. 3 & 4-8½ g. 655 m. 120 l. 6,339 c.
Geo. S. Gatchell, *Gen. Supt* ..... Buffalo, N. Y.
W. W. Halsey, *Asst. to G. Supt* .. Buffalo, N. Y.
Allen Vail, *Supt. M. P. & M* ..... Buffalo, N. Y.
Buff. Div.: Henry Dwyer, *Supt* .... Buffalo, N. Y.
Roch. Div.: , *Supt* ...... Olean, N. Y.
Pitts. Div.: E. H. Witter, *Supt* ...... Oil City, Pa.
H. J. Bookhammer, *M. M* ...... Oil City, Pa.
John Monks, *M. C. B* ...... Oil City, Pa.
C. E. Turner, *M. M* ...... Olean, N. Y.
Burlington, Cedar Rapids & Northern Ry
4-8½ g. 713 m. 76 lo. 3,006 cars.
C. J. Ives, *Pres* ...... Cedar Rapids, Ia.
Robt. Williams, *Gen. Supt* ... Cedar Rapids, Ia.
T. Stickney, *Pur. Agt* ...... Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B.* Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 35 m. 4 lo. 64 c.
G. L. Linsley, *Gen. Man. & Supt.* Burlington, Vt.
F. G. Brownell, *M. M., M. C. B. & P. A.* do.
Burlington & Mo. Riv. R. R. (in Neb.) (*See C. B & Q.*)
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 97 c.
Burlington & Western R. R. 3 g. 15 m. 38 c.
W. B. Jones, *Supt* ...... Burlington, Ia.
Burlington & Ohio River R. R. 4-8½ g.
R. Tanner, *Pur. Agt* ...... Chicago, Ill.

C

California Northern R. R. 4-8½ g. 26 m. 2 lo. 17 c.
Andrew J. Binney, *Gen. Man* .. Marysville, Cal.
California Southern R. R. 4-8½ g. 127 m. 13 lo. 301 c.
J. N. Victor, *Supt* ...... National City, Cal.
J. M. Keith, *M. M* ...... National City, Cal.
Cambridge & Seaford. (*See Penna. R. R.;* (4) *Div.*)
Camden Atlantic R. R. (*See Penna. R. R.;* (2) *Div.*)
Canada Southern Ry. (*See Mich. Cen.;* (2) *Div.*)
Canada Atlantic Ry. 4-8½ g. 82 m.
D. C. Linsley, *Man* ...... Ottawa, Ont.
M. Donaldson, *M. M* ...... Ottawa, Ont.
Canadian Pacific R. R. 4-8½ g. 1,742 m. 118 l. 2,726 c.
W. C. Van Horne, *Gen. Man* .... Montreal, Que.
T. G. Shaughnessy, *Asst. G. M.* Winnipeg, Man.
T. R. F. Brown, *Mech. Supt* ..... Montreal, Que.
T. G. Shaughnessy, *Pur. Agt* ... Montreal, Que.
E. Div.: Archer Baker, *Gen. Supt.* Montreal, Can.
Tho. Irwin, *Mech. Supt* ...... Brockville, Ont.
W. Div.: J. M. Egan, *Gen. Supt* .. Winnipeg, Man.
F. C. Butterfield, *M. M. & M. C. B.* Winnipeg, Man.
Cape F'r & Yadkin Val. R. R. 4-8½ g. 112 m. 7 lo. 60 c.
J. S. Morrison, *Gen. Supt* .... Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B.* .. Fayetteville, N. C.
Cape Girardeau Southwestern Ry.
4-8½ g. 33 m. 3 lo. 20 cars.
Louis Houck, *Gen. Man* .. Cape Girardeau, Mo.
W. A. Penney, *Gen. Supt.* Cape Girardeau, Mo.
W. H. Wheeler, *Pur. Agt.* Cape Girardeau, Mo.
Fred Glover, *M. M* ...... Cape Girardeau, Mo.
Carolina Central R. R. (*See Ral. & Aug.*)
Carillon & Grenville Ry. 5-6 g. 13 m.
R. W. Shepard, *Pres* ...... Montreal, Can.
Carson & Colorado R. R. (*See Va. & Truckee*).
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 581 c.
C. W. Chapman, *Supt. & P. A.* Catasauqua, Pa.
J. Thomas, *M. M* ...... Hokendauqua, Pa.
Chas. J. Holbach, *M. C. B* .... Catasauqua, Pa.
Catskill Mountain R. R. 3 g. 16 m. 2 lo. 26 cars.
Charles A. Beach, *Supt* ...... Catskill, N. Y.
Cazenovia, Canastota & De Ruyter. (*See U., I. & E.*)
Central and South-Western Railroads (Ga.).
5 g. 1,115 m. 145 lo. 2,008 cars.
W. G. Raoul, *Pres* ...... Savannah, Ga.
Wm. Rogers, *Gen. Supt* ...... Savannah, Ga.
C. H. Carson, *Pur. Agt* ...... Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M* ...... Savannah, Ga.
T. F. Warwick, *M. M* ...... Augusta, Ga.
F. Devine, *M. C. B* ...... Savannah, Ga.
So.-West'n Div.: T. D. Kline, *Supt* ..... Macon, Ga.
D. M. Gugel, *M. M* ...... Macon, Ga.
James A. Knight, *M. C. B* ...... Macon, Ga.
Central R. R. of N. J. (*See Phil. & Read.; N. J. Cen. Div.*)
Central R. R. of S. C. (*See Wil. & Wel.*)
Central American & Pacific Ry. 3 g. 67 m. 1 lo. 11 c
W. C. Fitzsimmons, *Gen. Supt* .. Escuintla, Guat.
Central Branch Union Pac. (*See Mo. Pac.:* (3) *Div.*)
Central Iowa Ry. 4-8½ g. 412 m. 50 lo. 1,959 cars.
E. L. Dudley, *Supt* ...... Marshalltown, Ia.
J. G. Johnston, *Asst. Supt* .... Marshalltown, Ia.
D. D. Phelps, *Asst. Supt* ...... Monmouth, Ill.
W. R. Coppock, *Asst. Pur. Agt.* Marshalltown, Ia.
John Player, *M. M* ...... Marshalltown, Ia.
T. L. Seevers, *M. C. B* ...... Marshalltown, Ia.
Central Ontario Ry. 4-8½ g. 33 m. 4 lo. 66 cars.
G. W. McMullen, *Gen. Man* ...... Picton, Ont.
James Falconar, *M. M* ...... Trenton, Ont.
Central Pac. R. R. 4-8½ g. 4,303 m. 382 lo. 11,260 c.
A. N. Towne, *Gen. Man* .... San Francisco, Cal.
J. A. Fillmore, *Gen. Supt* ... San Francisco, Cal.
R. H. Pratt, *A. G. Supt* .... San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt* .. Sacramento, Cal.
A. J. Stevens, *Gen. M. M* ..... Sacramento, Cal.
W. McKenzie, *Asst. G. M. M* .. Sacramento, Cal.
Benj. Welch, *Gen. M. C. B* .... Sacramento, Cal.
G. J. Turner, *Asst. G. M. C. B.* Sacramento, Cal.
Western; Visalia & Tulare Divs. and Northern Ry.
A. D. Wilder, *Supt* ...... W. Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.) W. Oakland, Cal.
W. B. Ludlow, *M. C. B.* (W. Div.) do.
S. Johnson, *M. M.* (T. Div.) ...... Tulare, Cal.
D. Rutherford, *M. M.* (N. Rd.). S. Vallejo, Cal.
Sacramento; Oregon Divs.; and Cal. Pac. R. R.
J. B. Wright, *Supt.* ...... Sacramento, Cal.
M. W. Cooley, *M. M.* (*S. Div.*) Sacramento, Cal.
Truckee Div.: J. H. Whited, *Supt.* Wadsworth, Nev.
Geo. Gregg, *M. M* ...... Wadsworth, Nev.
Wm. McPherson, *F. Car Sh* .. Wadsworth, Nev.
Humb't Div.: G. W. Coddington, *Supt.* Carlin, Nev.
W. F. Smith, *M. M* ...... Carlin, Nev.
J. C. Doughty, *For. Car Sh* ...... Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt* ..... Ogden, Utah.
James Lamb, *M. M* ...... Terrace, Utah.
A. Sherburne, *For. Car Sh* ..... Ogden, Utah.
Colorado Div.: E. E. Hewitt, *Supt* ... Needles, Cal.
St. & Cop. R. R.: R. L. Myrick, *Supt* .. Stockton, Cal.
Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hewitt, *Asst. Supt* .... Los Angeles, Cal.
James Velsir, *M. M* ...... Los Angeles, Cal.
T. T. Gilieland, *For. Car Sh.* Los Angeles, Cal.
Arizona Divs. (So. Pac.):
J. A. Muir, *Asst. Supt* ...... Tucson, Ariz.
W. F. Smith, *M. M* ...... Tucson, Ariz.
Rio Grande (S. Pac.) & El Paso (G. H. & S. A.) Divs.:
C. B. Seymour, *Supt* ...... El Paso, Texas.
J. L. Bonner, *M. M* ...... El Paso, Texas.
H. C. Standish, *For. Sh* ..... El Paso, Texas.
Galveston, Harrisburg & San Antonio System.
E. G. Thompson, *Supt* ...... Houston, Tex.
San Anto. Div.: W. G. Van Vleck, *Supt.*, and
J. J. Ryan, *M. M* ...... San Antonio, Tex.
D. T. Davis, *Supt. Car Shops.* Harrisburg, Tex.
Louisiana Div.: W. Irwin, *Supt* ..... Houston, Tex.
D. C. Smith, *M. M* ...... Houston, Tex.
El Paso Div.: Jas. Campbell, *Supt* .. El Paso, Tex.
J. L. Bonner, *M. M* ...... El Paso, Tex.
Central Texas & N'w'n R. R. (*See Hous. & Tex. Cen.*)
Central Vermont R. R. 4-8½ g. 673 m. 136 lo. 2,789 c.
J. W. Hobart, *Gen. Man* ...... St. Albans, Vt.
J. M. Foss, *Asst. Gen. Supt. & M. M.* St. Albans, Vt.
No. Div.: I. B. Futvoye, *Supt* ..... St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt* ...... Rutland, Vt.
N. L. Davis, *M. M. & C. B* ...... Rutland, Vt.
Brattleboro & Whitehall R. R., and
Brat. Div.: E. F. Brooks, *Supt* ... Brattleboro, Vt.
New London No'n R. R. 143 m. 22 lo. 303 c.
C. F. Spaulding, *Supt. & P. A.* New London, Ct.
I. W. Dow, *M. M* ...... New London, Ct.
S. O. Banks, *M. C. B* ...... New London, Ct.
Chagrin Falls & Southern R. R. 3 g. 6 m. 1 lo. 12 c.
W. Hutchings, *Gen. Man* ..... Chagrin Falls, O.
J. W. Williams, *Gen. Supt* .... Chagrin Falls, O.
Charleston & Savannah Ry. 5 g. 115 m. 17 lo. 190 c.
H. S. Haines, *Gen. Man* ...... Savannah, Ga.
C. S. Gadsden, *Gen. Supt* ...... Charleston, S. C.
H. A. Ulmo, *M. M* ...... Savannah, Ga.
Charlotte, Columbia & Augusta R. R. (*See Rich. & D.*)
Chateaugay R. R. 3 g. 34 m. 7 lo. 365 cars.
A. L. Inman, *Gen. Man* ..... Plattsburg, N. Y.
J. M. Davies, *Supt* ...... Lyon Mountain, N. Y.
M. L. French, *Asst. Supt* .... Plattsburg, N. Y.
Chatham Ry. 4-8½ g. 9 m.
J. B. Snowball, *Man* ...... Chatham, N. B.
Chattaroi Ry. 4-8½ g. 51 miles 11 loco. 483 cars.
F. H. Oliphant, *Gen. Man. & P. A.* Ashland, Ky.
J. R. Martin, *M. M* ...... Ashland, Ky.
Joseph P. Burleigh, *M. C. B* ..... Ashland, Ky.
Cheraw & Chester R. R. (*See Rich. & Dan.;* (2) *Div.*)
Cheraw & Darlington R. R. (*See Wil. & Wel.*)
Cheraw & Salisbury R. R. (*See Wil. & Wel.*)
Cherokee R. R. (*See East & West.*)
Cherry Valley R. R. 4-8½ g. 6 m. 3 lo. 6 cars.
E. T. Herndon, *Supt* ...... Midland, Mo.
Chesapeake, Ohio & South-Western.
4-9 g. 398 m. 62 lo. 1,345 c.
Gen. Supt ...... Louisville, Ky.
H. E. Huntington, *Pur. Agt* ..... Louisville, Ky.
J. E. Reeves, *Supt. Trans* ...... Louisville, Ky.
R. H. Briggs, *Supt. M. P* ...... Paducah, Ky.
D. L. Weaver, *M. M* ...... Elizabethtown, Ky.
Jno. Fitzgerald, *M. M* ...... Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 169 l. 5,120 c.
C. W. Smith, *Gen. Man* ...... Richmond, Va.
D. A. Sweet, *Asst. to Gen. Man.* Richmond, Va.
A. S. Emmons, *Pur. Agt* ...... Richmond, Va.
T. L. Chapman, *Supt. M. P* ...... Richmond, Va.
Eastern Div.: A. H. Wood, *Supt* .. Richmond, Va.
J. N. King, *M. C. B* ...... Richmond, Va.
J. B. Pierce, *M. M* ...... Richmond, Va.
Hunt. Div.: W. B. Ryder, *Supt* .... Hinton, W. Va.
W. H. Thomas, *M. M* .. Huntington, W. Va.
H. C. Bassinger, *M. C. B.* Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt.* Lexington, Ky.
S. R. Tuggle, *M. M* ...... Lexington, Ky.
K. C. Div.: G. W. Bender, *Supt* .. Lexington, Ky.
A. H. Watts, *M. M* ...... Lexington, Ky.
Cheshire R. R. 4-8½ g. 80 m. 31 lo. 531 cars.
R. Stewart, *Gen. Man* ...... Keene, N. H.
H. H. Stone, *Pur. Agt* ...... Keene, N. H.
F. A. Perry, *M. M* ...... Keene, N. H.
A. E. Howard, *M. C. B* ...... Keene, N. H.
Chester & Lenoir Ry. (*See Rich. & Dan.;* (3) *Div.*)
Chicago, Bur. & Kan. City Ry. (*See C. B. & Q.*)
Chicago, Burlington & Quincy R. R.
4-8½ g. 3,608 m. 545 lo. 21,012 cars.
T. J. Potter, *Gen. Man* ...... Chicago, Ill.
(1) C., B. & Q., East of Mo. Riv.
H. B. Stone, *Asst. Gen. Man* ...... Chicago, Ill.
Wm. Irving, *Gen. Pur. Agt* ...... Chicago, Ill.
G. W. Rhodes, *Supt. M. P.* ...... Aurora, Ill.
Wm. Forsyth, *Mech. Eng* ...... Aurora, Ill.
Ill. Divs.: J. D. Besler, *Supt* ...... Galesburg, Ill.
Chi. Div.: Geo. Alexander, *Supt* ... Aurora, Ill.
L. E. Johnson, *M. M* ...... Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt.* Galesburg, Ill.
Robert Colville, *M. M* ...... Galesburg, Ill.
St. L. Div.: W. C. Brown, *Supt.* Beardstown, Ill.
A. Forsyth, *M. M* ...... Beardstown, Ill.
Ia. & Mo. Divs.: W. F. Merrill, *Supt.* Burlington, Ia.
East. Div.: O. E. Stewart, *Supt.* .. Burlington, Ia.
Joel West, *M. M* ...... Burlington, Ia.
Mid. Div.: J. B. Maxon, *Supt* ..... Ottumwa, Ia.
West'n Div.: J. H. Duggin, *Supt* .... Creston, Ia.
C. W. Eckerson, *M. M* ...... Creston, Ia.
Chi., B. & Kan. C'y and St. L., Keo. & No.-W'n Rys.
Robt. Law, *Gen. Supt* ...... Keokuk, Ia.
W. H. Bartlett, *M. M* ...... Burlington, Ia.
(2) C. B. & Q., West of Mo. Riv.
G. W. Holdrege, *Asst. Gen. Man.* Omaha, Neb.
C. M. Wead, *Supply Agt* ...... Omaha, Neb.
D. Hawksworth, *M. M* ...... Plattsmouth, Neb.
C. M. Wead, *Storek'pr* ...... Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
T. E. Calvert, *Gen Supt* ...... Lincoln, Neb.
D. E. Thompson, *Supt* ...... Lincoln, Neb.
E. Bignell, *M. M* ...... Lincoln, Neb.
R. V. Div.: A. Campbell, *Supt* ..... McCook, Neb.
A. & N. Div.: J. McConniff, *Supt* ... Lincoln, Neb.
Chicago, Fairchild & Eau Claire R. R.
4-8½ g. 20 m. 3 lo. 28 cars.
N. C. Foster, *Gen. Man* ...... Fairchild, Wis.
C. I. Wickersham, *Pur. Agt* ...... Chicago, Ill.
Chicago, Iowa & Dakota Ry. 4-8½ g. 26 m.
John Porter, *Gen Man* ...... Eldora, Ia.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 5,201 m. 626 lo. 19,018 cars.
S. S. Merrill, *Gen. Man* ...... Milwaukee, Wis.
R. Miller, *Asst. Gen. Man* ... Milwaukee, Wis.
J. T. Clark, *Gen. Supt* ...... Milwaukee, Wis.
A. J. Earling, *Asst. Gen. Supt.* Milwaukee, Wis.
J. T. Crocker, *Pur. Agt* ...... Milwaukee, Wis.
J. M. Lowry, *Gen. M. M* ...... Milwaukee, Wis.
E. Fairbairn, *M. M* ...... Milwaukee, Wis.
John Bailie, *Supt. Car Dept* ... Milwaukee, Wis.
W. E. Kittridge, *M. C. B* ..... Milwaukee, Wis.
(1) C. & C. B. Div. in Ill.:
G. O. Clinton *Supt* ...... Chicago, Ill.
La Crosse Div.: W. G. Collins, *Supt.* Milwaukee, Wis.
P. du C. & M. Pt. Divs.:
S. J. Collins, *Supt* ...... Milwaukee, Wis.
(2) C. H. Prior, *Asst. Gen. Supt* .. Minneapolis, Minn.
H. & D. Div.: W. M. Kellie, *Supt.* do.
J. O. Pattie, *M. M* ...... Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt.* do.
S. Minn. Div.: F. D. Underwood, *Supt.* Lacrosse, Wis.
Riv. & Dub. Divs.: C. W. Case, *Supt.* Dubuque, Ia.
S. Charnley, *M. M* ...... Dubuque, Ia.
Ia. & Da. Div.: G. W. Sanborn, *Supt.* Mason City, Ia.
S. Cy. & Da. Div.: W. J. Underwood, *Supt.* Sioux Cy, Ia.
F. H. Moulton, *M. M* ...... Yankton, Dak.
J. M. Horan, *For* ...... Yankton, Dak.
(3) D. A. Olin, *Asst. Gen. Supt* ...... Racine, Wis.
R. & S. W. Divs.: D. L. Bush, *Supt* ... Racine, Wis.
John Taylor, *M. M.* ...... Racine, Wis.
(4) Northern Div.: L. B. Rock, *Supt.* Milwaukee, Wis.
Wm. E. Kittredge, *M. C. B* .. Milwaukee, Wis.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 309 lo. 8,367 cars.
R. R. Cable, *Pres. & Gen. Man* .... Chicago, Ill.
A. Kimball, *V. P. & Gen. Supt* ..... Chicago, Ill.
H. F. Royce, *Asst. G. Supt* ...... Davenport, Ia.
F. A. Marsh, *Pur. Agt* ...... Chicago, Ill.
T. B. Twombly, *Gen. M. M* ...... Chicago, Ill.
B. K. Verbryck, *Gen. M. C. B* ...... Chicago, Ill.
Ill. Div.: R. H. Chamberlin, *Supt* ..... Chicago, Ill.
R. Biester, *M. M* ...... Chicago, Ill.
Sam'l Pullman, *M. C. B* ...... Chicago, Ill.
Ia. Divs.: Jno. Given, *Supt* ...... Des Moines, Ia.
J. G. Crockett, *M. M* ...... Stuart, Ia.
Jas. E. Morrill, *M. M* ...... Davenport, Ia.
Chas. M. Leonard, *M. C. B* ...... Davenport, Ia.
K. & Des. M. Div.: Jno. Given, *Supt* .. Des Moines, Ia.
S. W. Wakefield, *M. M* ...... Keokuk, Ia.
Henry Kummer, *M. C. B* ...... Keokuk, Ia.
So.-Wn. Div.: G. F. Walker, *Supt* .... Trenton, Mo.
R. O. Carscadin, *M. M* ...... Trenton, Mo.
Chas. R. Best, *M. C. B* ...... Trenton, Mo.
Chicago, Saginaw & Canada R. R. (*See Det., L. & N.*)
Chicago, St. Louis & New Orleans R. R. (*See Ill. Cen.*
Chicago, St. Louis & Pittsburg R. R.
4-9 g. 635 m. 202 lo. 3,510 cars.
James McCrea, *Manager* ...... Columbus, O.
Wm. Mullins, *Gen. Pur. Agt* .... Pittsburg, Pa.
Edward B. Wall, *Supt. M. P* .... Columbus, O.
1, 3 & 5 Divs.: J. F. Miller, *Supt.* Richmond, Ind.
Robert Curtis, *M. M* ...... Columbus, O.
J. L. Copeland, *G. F. Car Shops.* Columbus, O.
W. C. Arp, *Gen. For* ...... Indianapolis, Ind.
2 & 4 Divs.: Chas. Watts, *Supt.* Logansport, Ind.
W. W. Reynolds, *M. M* ..... Logansport, Ind.
Chas. H. Starr, *G. F. C. Shops*, Logansport, Ind.
Chicago, St. Louis & Wn. R. R. 4-8½ g. 88 m. 11 lo. 1,799 c.
F. E. Hinckley, *Gen. Man* ...... Chicago, Ill.
A. H. Crocker *Supt* ...... Streator, Ill.
J. N. Chilson, *M. C. B* ...... Streator, Ill.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 1,280 m. 181 lo. 5,221 cars.
J. M. Whitman, *Gen. Supt* ...... St. Paul, Minn.
W. H. S. Wright, *Pur. Agt* ...... St. Paul, Minn.
Matt. Ellis, *M. M* ...... St. Paul, Minn.
J. J. Ellis, *Asst. M. M* ...... St. Paul, Minn.
H. L. Preston, *M. C. B* ...... Hudson, Wis.
Ea. & No. Div.: A. A. Hobart, *Supt.* St. Paul, Minn.
St. Paul and Sioux City Div.:
H. Spencer, *Supt* ...... St. James, Minn.
H. C. Anderson, *Asst. M. M* .... Sioux Cy, Ia.
Neb. Div.: Jas. McCabe, *Supt* ..... Omaha, Neb.
Chic., Tex. & Mexican Cent. Ry. (*See Gulf, C. & S. F.*)
Chicago & Alton R. R. 4-8½ g. 849 m. 213 lo. 6,168 c.
C. H. Chappell, *Gen. Man* ...... Chicago, Ill.
T. L. Bates, *Supt. of Trans* ... Bloomington, Ill.
A. V. Hartwell, *Pur. Agt* ...... Chicago, Ill.
Wm. Wilson, *Supt. of Mach* ... Bloomington, Ill.
Jos. Townsend, *G. For. Car Dept.* do.
Chi. Div.: A. M. Richards, *Supt.* Bloomington, Ill.
St. L. & K. C. Div.: S. D. Reeves, *Supt.* Roodhouse, Ill.
L. H. Miller, *M. M* ...... Slater, Mo.
Chicago & Atlantic Ry. 4-8½ g. 269 m.
F. Broughton, *Gen. Man* ...... Chicago, Ill.
J. H. Parsons, *Supt* ...... Chicago, Ill.
C. J. Domville, *M. M. & M. C. B.* Huntington, Ill.
Chi. & East'n Ill. 4-8½ g. 252 m. 56 lo. 3,500 cars.
O. S. Lyford, *Gen. Supt* ...... Chicago, Ill.
D. R. Patterson, *Pur. Agt* ...... Chicago, Ill.
P. W. Drew, *M. Trans* ...... Chicago, Ill.
Allen Cooke, *M. M* ...... Danville, Ill.
Chicago & Grand Trunk Ry. (*See Grand Trunk.*)
Chicago & Great Southern Ry.
4-8½ g. 124 m. 4 lo. 122 c.
Henry Crawford, *Gen. Man* ...... Chicago, Ill.
H. Crawford, Jr., *Supt* ...... Chicago, Ill.
Chicago & Iowa R. R. 4-8½ g. 104 m. 16 lo. 237 cars.
T. J. Potter, *Gen. Man* ...... Chicago, Ill.
W. H. Holcomb, *Gen. Supt* ...... Rochelle, Ill.
H. S. Bryan, *M. M* ...... Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 3,761 m. 637 lo. 21,000 cars.
Marvin Hughitt, *2d V. Prs. & G. M.* Chicago, Ill.
C. C. Wheeler, *Gen. Supt* ...... Chicago, Ill.
W. B. Linsley, *Ass't Gen. Supt* .... Chicago, Ill.
R. W. Hamer, *Pur. Agt* ...... Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M.*; and
Wm. Campbell, *A. Supt. M. P. & M.* Chicago, Ill.
Wis. and Mil. Divs. & Sheboygan & W'n Ry.:
Ed. J. Cuyler, *Supt* ...... Chicago, Ill.
Gal. Div.: Chas. Murray, *Supt* ...... Chicago, Ill.
Pen'a Div.: W. F. Fitch, *Supt* ..... Escanaba, Mich.
J. Symons, *M. M* ...... Escanaba, Mich.
Mad. Div.: C. A. Swineford, *Supt* .. Baraboo, Wis.
Minn. & Dak. Divs.: S. Sanborn, *Asst. Gen. Supt.*
and W. A. Scott, *M. M* ...... Winona, Minn.
Dak. Cen. Ry.: J. S. Oliver, *Supt* .... Huron, Dak.
Ia. Div.: H. G. Burt, *Supt* ...... Boone, Ia.
Geo. W. Lowe, *M. M* ...... Clinton, Ia.
No. Ia. Div.: M. Hopkins, *Supt* ... Eagle Grove, Ia.
Win. & St. P. Div.:
W. P. Cosgrave, *Supt* ...... Winona, Minn.
Chicago & West Michigan:
4-8½ g. 409 m. 47 lo. 1,629 cars.
J. B. Mulliken, *V. P. & G. Man.* Muskegon, Mich.
A. M. Nichols, *Gen. Supt* ...... Gd. Rapids, Mich.
J. K. V. Agnew, *A. G. Supt.* Grand Rapids, Mich.
Allen Bourne, *Pur. Agt* ...... Detroit, Mich.
W. F. N. Davis, *M. M* ...... Muskegon, Mich.
Chicago & West'n Ind. R. R. 4-8½ g. 50 m. 12 lo. 150 c.
James D. Carson, *Gen. Man* ...... Chicago, Ill.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 2 lo. 77 cars.
D. P. Hyatt, *Gen Man* ...... Dayton, O.
Cin., Georgetown & Portsmouth. 3 g. 35 m. 3 lo. 45 c.
M. Simmons, *Supt* ...... Cincinnati, O.
F. Enler, *M. M* ...... Cincinnati, O.
Cincinnati & Green River Ry. 3 g. 11 m. 2 lo. 41 c.
G. B. Harper, *Supt* ...... Grove, Ky.
Geo. W. Lewis, *M. M* ...... Grove, Ky.
Cin., Hamilton & Dayton R. R. 4-9 g. 352 m. 92 l. 2,932 c.
C. J. Hepburn, *Gen. Supt* ...... Cincinnati, O.
W. F. Stark, *Asst. Supt* ...... Toledo, O.
John Black, *Gen. M. M* ...... Lima, O.
W. H. H. Allison, *M. C. B* ...... Cincinnati, O.
Cincinnati, Hamilton & Indianapolis R. R.
4-8½ g. 98 m
C. J. Hepburn, *Supt* ...... Cincinnati, O.
Day. & Mich. Div.:

BENJAMIN ATHA, Treasurer. **RICHARD VOSE, President.** **D. P. CLARK Supt.**

We make our own Steel for Car Springs.



Spring Manufactory and Steel Works, Newark, N. J.

The Largest Crucible Cast-Steel Works in the Eastern States.

NATIONAL CAR SPRING COMPANY,

MANUFACTURERS OF

Elliptic, Volute-Spiral Hebbard, Oval, Round Bar, Rectangular-Passenger & Freight Car Springs

OFFICE, 13 BARCLAY STREET, NEW YORK.

HOPKINS VERSUS LE ROY!

In the recent interference patent fight between Hopkins and Le Roy, the Commissioner of Patents, in his final decision, which was rendered August 31, 1883, says:

"On the broad claim, as well as the specific claim covering the device embodying not only the broad but the specific invention of a journal bearing with a soft metal lining, with ridges or projections so arranged that, upon being brought in contact with the axle, the ridges or projections will yield and spread out so as to make a perfectly-fitting box, priority of invention must be awarded to Hopkins."

As to the specific arrangement for which priority of invention was awarded to Le Roy, all will perceive that the broad claim for which priority of invention is awarded to Hopkins, and the very broad claim embodied in the patent granted him Oct. 16, 1883, in the following words: "A Journal Bearing made of two different metals, one of soft or yielding nature, and the other of a hard or unyielding nature, the soft or yielding carrying ridges or spurs which receive the initial pressure of the journal, and by the rolling action of the same and the load pressure upon the bearing becomes crushed down and spread in conformity with the contour thereof, as described, whereby the surfaces in wearing contact are adjusted to each other, substantially as specified,"

COVERS THE WHOLE CASE

As to his being the prior inventor of Bearings with soft metal ridges for receiving the Initial pressure of the Journal, and leaves him absolute master of the situation.

THE QUESTION.

Does the Le Roy Journal Bearing Company "stand ready" to make what are commonly known as Hopkins Journal Bearings, because of numerous disgusting failures, resulting from the use of the weak, gridiron arrangement known as the Le Roy Bearing heretofore made and sold by them, and the consequent necessity of going out of business or giving their customers a really good bearing even if they have to "pirate" the invention for which a patent was granted to Hopkins that has been declared valid by both the Eastern and Western Railroad Association?

Does the Le Roy Company expect to build up a business by infringing Hopkins' Patent, and selling bearings, and a lawsuit with them?

AN OLD ADAGE SAYS:
"SUE A BEGGAR AND CATCH A LOUSE."

Will Mr. McLean, of the so-called Le Roy Journal Bearing Co., give to Mr. Hopkins and to Railroad Companies and Car-Builders any reliable proof that his Company is in reality anything else than an irresponsible piratical concern (see his advertisement) that is absolutely judgment proof, and any guarantees it may offer against suits by Hopkins are not perfectly worthless, and in so doing will he talk plain, honest common sense, instead of craftily stringing together a lot of words (see his advertisement) that mean nothing unless they mislead?

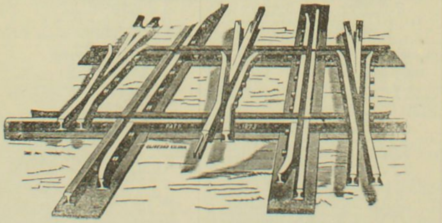
No invention ever did or can infringe any patent. It is not the invention in any case that infringes, but the making, selling or using of a thing patented without the right to do so. Talk about making an offer to settle a point that does not exist is as cheap as it is misleading and worthless.

All parties are hereby warned that my rights under said Letters Patent will be enforced.

D. A. HOPKINS, Patentee and Manufacturer,

113 Liberty Street, - - - - New York.

ELLIOT'S PATENT STEEL RAIL FROGS AND CROSSINGS.



These Frogs and Crossings are made of steel rail, combined with a wrought-iron frame, and bound together transversely with strong bolts, which gives them great strength and durability without destroying their elasticity. They are connected at all ends by Fish-Plate Joints, and lie on the same tie surface as the running rail without any cutting of ties, thus saving a great deal of time and labor in putting in place on track.

Manufactured by ELLIOT. FROG & SWITCH CO.,
East St. Louis, Ill.

THE EGAN COMPANY,

MANUFACTURERS OF THE

Most Improved and Patented **WOOD-WORKING MACHINERY,**
Nos. 235 to 255 WEST FRONT STREET, CINCINNATI, O., U. S. A.

WHITE LEAD.

JEWETT & SONS PERFECTLY PURE WHITE LEAD

We have made but ONE QUALITY of WHITE LEAD for the last twenty-five years. It is ground in Refined Linseed Oil, and warranted perfectly pure.

THE JEWETT WHITE LEAD CO.,
28 BURLING SLIP, NEW YORK.

LINSEED OIL.

J. A. DEAN & CO. PERFECTLY PURE LINSEED OIL

All Linseed Oil bearing the above brand delivered by us is of OUR OWN MANUFACTURE, and guaranteed absolutely pure.

Our BOILED OIL will be POSITIVELY BOILED.

J. A. DEAN & CO.,
181 FRONT STREET, NEW YORK.

Cincinnati, Indianapolis, St. Louis & Chicago Ry.
4-8½ g. 384 m. 71 lo. 3,279 cars.
J. W. Sherwood, *Supt*........Indianapolis, Ind.
Geo. Tozzer, *Pur. Agt*..........Cincinnati, O.
J. S. Patterson, *M. of Mach. & M. C. B.* Cincinn., O
Cincinnati, New Orleans & Texas Pacific Ry. Co.
5 g. 846 m. 123 lo. 3,464 cars.
John Scott, *Gen. Man*..........Cincinnati, O
Richard Carroll, *Gen. Supt*.......Cincinnati, O.
R. W. Healey, *Gen. Pur. Agt*.....Cincinnati, O.
James Meehan, *S. M. P. & M*... Cincinnati, O.
Cin. So. Div.: W. W. Wells, *Supt*..Somerset, Ky.
J. L. Tomlinson, *Asst. S. M. P*.. Ludlow, Ky
John Richardson, *M. C. B*.... .Cincinnati, O.
A. Thomson, *M. M*.......Chattanooga, Tenn.
Ala. Gr. S'n Div.: D. McLaren, *Supt.*, and
George Manuell, *M. M*...Chattanooga, Tenn
J. M. Kelly, *M. C. B*.....Chattanooga, Tenn.
V. & M. Div.: E. F. Raworth, *Supt.*, and
M. M.... Vicksburg, Miss.
V.S. & P. Div.: F. Y. Dabney, *Supt*..Monroe, La.
W. Bell Smith, *M. M. & C. B*.....Monroe, La.
New Orleans & North-Eastern R. R.
T. S. Williams, *Supt*........New Orleans, La.
I. W. Fowle, *M. M*............Meridan, Miss.
Cincinnati Northern Ry.
Geo. L. Barringer, *Gen. Man* ...Cincinnati, O.
Cincinnati, Richmond & Chicago R. R. 4-9 g. 37 m.
C. J. Hepburn, *Supt*.............Cincinnati, O.
Cincinnati, Selma & Mobile R.R. 5 g. 71 m. 6 lo. 148 c.
A. McCollister, *Supt*...............Selma, Ala.
H. L. Wright, *Pur. Agt*.............Selma, Ala.
J. M. Levis, *M. M*..................Marion, Ala.
Cincinnati, Van Wert & Michigan R. R.
4-9 g. 81 m. 7 lo. 168 cars.
E. Garrison, *Gen. Man*............Van Wert, O.
D. R. Ennis, *Supt. & P. A*........Van Wert, O.
H. H. Garr, *M. M. & M. C. B* .....Van Wert, O.
Cin., Wabash & Mich. Ry. 4-8½ g. 165 m. 13 lo. 402 c.
Norman Beckley, *Gen. Man. & P. A.* Elkhart, Ind.
O. W. Lamport, *Supt*............Wabash, Ind.
S. B. Tinker, *M. M. & M. C. B* ...Wabash, Ind
Cin., Wash. & Balt. 4-8½ g. 312 m. 65 lo. 1,422 cars
Jas. H. Stewart, *Gen. Man*.......Cincinnati, O.
Edw. Evans, *M. M* ....Chillicothe, O.
T. G. Duncan, *Supt. Car Dept*.......Zaleski, O.
Cincinnati, Wheeling & New York R.R. 4-8½ g. 13 m.
Thos. R. Sharp, *Pres*..........New York, N. Y.
Cincinnati & Eastern Ry. 3 g. 100 m. 7 lo. 133 cars.
S. Woodward, *Gen. Man*... .Cincinnati, O.
G. H. Wilber, *Gen. Sup. & Pur. Agt*. Cincinnati, O.
P. W. Naughton, *M. M*............Newtown, O.
Cincinnati & South-Eastern Ry. 4-8½ g. 18 m.
John V. Patton, *Gen. Man*... .Newport, Ky.
Clarksburg, Weston & Glenville R. R.
3 g. 26 m. 3 lo. 45 cars.
A. H. Kunst, *Pres. & Gen. Man*. Weston, W. Va.
Sam. A. Steel, *M. M*............Weston, W. Va.
F. Dillie, *M. C. B*..........Nottingham, O.
Cleveland, Columbus, Cincinnati & Indiana and Indianapolis & St. Louis Rys. and Dayton & Union R. R. 4-8½ g. 785 m. 246 lo. 7,988 cars.
E. B. Thomas, *Gen. Man*.........Cleveland, O.
J. L. Yale, *Pur. Agt*.............Cleveland, O.
W. F. Turreff, *Gen. M. M*.........Cleveland, O.
Col. & Cin. Div.: Robt. Blee, *Supt* .Cleveland, O.
Wm. Garsting, *M. M*.........Cleveland, O.
A. G. Steinbrenner, *G. For. Car Dept*. do.
Ind'p'lis Div.: John O. Ewan, *Supt*..Ind'polis, Ind
T. W. Ranson, *M. M*. .....Brightwood, Ind.
N. Mark, *G. For. Car Dept*. Brightwood, Ind.
Ind. & St L Ry.: Tho. Burrows, *Supt*. St. Louis, Mo.
T. W. Ranson, *M. M. & C. B.* Brightwood, Ind.
Day. & Un. Rd.: J. H. Barrett, *Supt*. Cincinnati, O
H. S. Gordon, *For. M. Shops* ......Dayton, O.
Clevel'd, Delphos & St. Louis R.R. 3 g. 56 m. 3 lo. 39 c.
I. H. Burgoon, *Gen. Man*..........Delphos, O.
B. F. Marshall, *M. M*...............Delphos, O.
Cleveland, Indiana & St. Louis R. R.
4-8½ g. 19 m. 2 lo. 20 cars.
J. A. Larned, *Rec. & Supt*......Anderson, Ind.
Cleveland, Mt. Vernon & Delaware R. R.
4-9 g. 144 m. 24 lo. 828 c.
N. Monsarrat, *Gen. Supt*..............Akron, O.
G. M. Taylor, *M. M. & C. B*.....Mt. Vernon, O.
Cleve., Youngstown & Pitts. R. R. 3 g. 30 m. 3 lo. 138 c.
D. T. Lumley, *Gen. Supt*.. ....Alliance, O.
C. H. Dorman, *M. M. & M. C. B*....Alliance, O.
Cleveland, Lorain & Wheeling Ry.
4-8½ g. 158 m. 31 lo. 1,878 cars.
Oscar Townsend, *Gen. Man* ......Cleveland, O.
Wm. Thornburg, *Supt*......... . ..Lorain, O.
W. A. Stone, *M. M*..................Lorain, O.
Cleve. & Marietta R. R. (*See Wheel. & Lake Erie.*)
Cleveland & Pittsburg. (*See Penna. Co.; (4) Div.*)
Clifton & Port Hudson R. R. 4-8½ g. 22 m. 3 lo. 12 c.
D. W. Pipes, *Supt*.......... ....Clinton, La.
W. F. Lockwood, *M. M*.......... ..Clinton, La.
Clove Branch R. R. 4-8½ g. 4 m. 1 lo. 61 cars.
C. L. Kimball, *Supt*...... ...Mattewan, N. Y.
W. G. Vanbuskirk, *M. M*...Dutchess Jc., N. Y.
Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 255 cars.
Jas. R. Barber, *Gen. Supt*... ....Cobourg, Ont.
Jas. Clark, *M. M*... .... Cobourg, Ont
John Tinney, *M. C. B*............Cobourg, Ont.
Colorado Central R. R. (*See Un. Pac.; (4) Div.*)
Columbia & Greenville R. R. (*See Rich. & D.; (3) Div.*)
Columbia & Puget Sound R.R. 3 g. 21 m. 7 lo. 114 c.
J. L. Howard, *Gen. Supt*.. San Francisco, Cal.
Columbus, Hocking Valley & Toledo Ry.
4-9 g. 324 m. 90 lo. 7,353 cars.
G. R. Carr, *Gen. Supt*.............Columbus, O.
W. M. Greene, *Pur. Agt*..........Columbus, O.
Ira G. Hutchins, *M. M*...... ....Columbus, O.
J. M. Rockafield, *M. C. B*....... .Columbus, O.
Tol. Div.: M. T. Seymour, *Supt*......Columbus, O.
Hock. V. Div.: M. P. L. Booth, *Supt*. Columbus, O.
Ohio Riv. Div.: C. D. Norris, *Supt*.......Logan, O.
Columbus & Eastern R. R. In progress
J. E. Redfield, *Pres*....... ...Columbus, Ohio.
Columbus & Maysville Ry. (*See Cin. & East.*)
Columbus & Rome R. R. 3 g. 33 m. 3 lo. 30 cars.
M. E. Gray, *Supt* ... . .Columbus, Ga.
Columbus & Western Ry. 5 g. 89 m. 6 lo. 53 cars
E. A. Flewellen, *Gen. Man*. ...Columbus, Ga.
R. A. Bridges, *M. M* ....Opelika, Ala.
Concord R. R. 4-8½ g. 141 m. 38 lo. 1,235 cars.
H. E. Chamberlain, *Supt. & P. Agt*. Concord, N.H.
J. T. Gordon, *M. M. & C. B*.. .Concord, N. H
Concord & Claremont R. R. (*See Northern of N. H.*
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 42 lo. 554 c.
J. Mulligan, *Supt. & Pur. Agt*. Springfield, Mass.
W. H. Stearns, *M. M. & M. C. B*.. Springfield, Mass.
Conn. & Passumpsic Rivers R. R. (*See Passumpsic*)
Connotton Valley R. R. 3 g. 160 m. 26 lo. 997 cars.
Samuel Briggs, *Gen. Man*..... .Cleveland, O.
B. C. Bosworth, *M. M*.............. .Canton, O.
Cooperstown & Susquehanna Valley R. R.
4-8½ g. 16 m. 2 lo. 14 cars.
Andrew Shaw, *Pres* ....Cooperstown, N. Y.
A. Mumford, *M. M*.........Cooperstown, N. Y.
Corning, Cowanesque & Antrim Ry. (*See Syr., G. & C.*)
Cornwall R. R.. 4-8½ g. 12 m. 5 lo. 166 cars
J. M. Havard, *G. Supt. & M. M*....Lebanon, Pa.
Levi Blonch, *M. C. B* ... .Lebanon, Pa.
Cornwall & Lebanon R. R. 4-9 g. 5 m.
J. C. Jennings, *Supt*.......... ...Lebanon, Pa.
Coudersport & Port Allegheny R. R.
3 g. 17 m. 2 lo. 64 cars.
B. A. McClure, *Gen. Supt*.....Coudersport, Pa.
Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 535 cars.
Wm. Whyte, *Gen. Supt*..... .....Toronto, Ont.
John Macnab, *Pur. Agt*..... .....Toronto, Can.
D. Preston, *Mech. Supt*....... ...Toronto, Can.
Crooked Creek R. R. 3 g. 9 m. 1 lo. 37 cars.
Walter C. Willson, *Gen. Man*. Webster City, Ia.
Geo. W. Post, *Pur. Agt*.............. Lehigh, Ia.
Crown Point Iron Co. R. R. 3 g. 13 m. 4 lo. 113 c.
A. L. Inman, *Gen. Man*..... .Plattsburg, N. Y.
H. L. Reed, *Pur. Agt* ......Crown Point, N. Y.
J. M. Davies, *Supt. & M. M*..Crown Point, N. Y.
J. C. Sherman, *M. C. B*.... Crown Point, N. Y.
Cumberland Ry. 4-8½ g. 32 m. 1 lo. 64 c.
J. A. Killam, *Gen. Man*.........Parsboro, N. S.
K. McKinnon, *M. M* ....Parsboro, N. S.
Cumberland Valley R. R. 4-9 g. 127 m. 25 lo. 474 cars.
J. F. Boyd, *Supt*...... .....Chambersburg, Pa.
A. S. Hull, *M. M*......... ..Chambersburg, Pa.
C. Wicke, *M. C. B*..... ...Chambersburg, Pa.
Cumberland & Maurice River R. R. 4-8½ g. 20 m.
L. H. Dowdney, *Supt*........Port Morris, N. J.
Cumberland & Penn. R. R. 4-8½ g. 55 m. 28 lo. 625 c.
P. L. Burwell, *Gen Supt & P A*. Cumberland, Md.
N. W. Howson, *Mast. of Mach*. Mt. Savage, Md.
Nathan Binix, *M. C. B*.........Mt. Savage, Md.

D

Danville & New River R. R. 3 g. 43 m. 2 lo. 30 c.
W. T. Sutherlin, *Gen. Man*.......Danville, Va.
W. T. Whittaker, *M. M*...........Danville, Va.
Danbury & Norwalk R. R. 4-8½ g. 36 m. 7 lo. 112 c.
C. M. Crawford, *G. Supt. & P. A*..S. Norwalk, Ct.
W. H. Wilkinson, *M. M. & C. B*. Danbury, Conn.
Danville, Mocksville & So.-Wn. R. R. 3 g. 28 m.
H. M. Shivler, *Supt*...........Leakesville, N. C.
Danville, Olney & O. R. R.R. 4-8½ g. 110 m. 5 lo. 83 c.
C. E. Henderson, *Rec. & Man*........Olney, Ill.
W. A. Bell, *M. M. & C. B*.. .... ..Kansas, Ill
Dayton & Union R. R. (*See Clev., Col., Cin. & Ind.*)
Dayton & Michigan R. R. (*See Cin., Ham. & Day.*)
Del. Lackawanna & W. and N. Y., Lack. & W. R. Rs.
4-8½ g. 930 m. 436 lo. 31,989 cars.
Wm. F. Halstead, *Gen. Supt*.. ...Scranton, Pa.
G. W. B. Cushing, *Pur. Agt*. ..New York, N. Y.
Walter Dawson, *Mast. of Mach*...Scranton, Pa.
Robt. McKenna *M. C. B* . . .Scranton, Pa.
Bloomsb'g Div.: C. Graham, *M. M*..Kingston, Pa.
Utica Div.: A. C. Salisbury, *Supt*....Utica, N. Y.
Thos. Thatcher, *M. M*..........Utica, N. Y.
Morris & Essex Div.; Sussex; P. & D. and C. R. Rs.
A. Reasoner, *Supt*.... ....Hoboken, N. J.
W. H. Lewis, *M. M*......... Kingsland, N. J.
J. W. Baker, *Mast. Car Rep*. ....Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, *Supt*............Oswego, N. Y.
Jas. Buchanan, *M. M*. .. ..Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, *Gen. Supt*... ...Syracuse, N. Y.
Jas. Buchanan, *M. M*.. ......Syracuse, N. Y.
Cayuga Div.: W. R. Humphrey, *Supt*. Ithaca, N.Y.
Delaware, Maryland & Virginia R. R.
4-8½ g. 101 m. 7 lo. 145 cars.
Tho. Groom, *Supt*..... ....Lewes, Del.
Geo. Messick, *M. M*..................Lewes, Del.
W. H. Virden, *M. C. B*...............Lewes, Del.
Delaware River R. R. 4-8½ g. 20 m. 3 lo. 4 cars.
E. H. Green, *Supt*..........Pedricktown, N. J.
Delaware Western R. R. (*See Balt. & Phil.*)
Delaware & Chesapeake R. R. (*See Penna.; (4) Div.*)
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 634 m. 180 lo. 10,799 cars.
C. F. Young, *Gen. Man*......... Honesdale, Pa.
J. White Strong, *Pur. Agt*........Albany, N. Y.
R. C. Blackall, *Supt. of Mach*..... .Albany, N. Y.
Susq. Div.: C. D. Hammond, *Supt*. Albany, N. Y..
Tho. Howard, *M. M*............Oneonta, N. Y.
J. R. Skinner, *M. C. B*. ....Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, *Supt*...Troy, N. Y.
J. L. Corey, *M. M*......... Green Island, N. Y.
Chr. Körner, *M. C. B*..... Green Island, N. Y.
Pa. Div.: R. Manville, *Supt & Pur Agt*. and
S. H. Dotterer, *M. M*.... ...Carbondale, Pa.
T. Orchard, *M. C. B*....... ... Carbondale, Pa.
Denver Circle R. R. 3 g. 12 m. 7 lo. 15 cars
Theo. C. Henry, *Gen. Man*.........Denver, Col.
J. H. Bedson, *Gen. Supt*...........Denver, Col.
Denver, Utah & Pacific R. R. 3 g. 34 m. 2 lo. 58 c.
L. M. Fouts, *Supt*...... ....Denver, Col.
Denver & New Orleans. 4-8½ g. 140 m. 11 lo. 400 c.
C. W. Fisher, *Gen. Man*............Denver, Col.
Chas. Wheeler, *Pur. Agt*.... .....Denver, Col.
J. H. Kirk, *M. M. & M. C. B*.... ..Denver, Col.
Denver & Rio Grande Ry. 3 g. 1,665 m. 222 lo. 5,932 c.
D. C. Dodge, *Gen. Man*..............Denver, Col.
C. M. Hobbs, *Pur. Agt* ... .Denver, Col.
N. W. Sample, *Supt. M. P. & M* ...Denver, Col.
(1) Col. & N. M. Div.: R. E. Ricker, *G. S.* Denver, Col
1st Div.: W. W. Borst, *Supt*.......S. Pueblo, Col.
2d Div.: Cole Lydon, *Supt*..... ... Alamosa, Col.
3d Div.: G. W. Cook, *Supt*.........Leadville, Col
4th Div.: R. M. Ridgway, *Supt*.......Salida, Col.
(2) Utah Div.: W. H. Bancroft, *G. S.* S. Lake City, Utah.
Des Moines, Osceola & Southern R. R.
3 g. 100 m. 7 lo. 253 cars.
L. B. Harding, *Gen. Man*.......Des Moines, Ia.
Henry Stivers, *Supt*.......... .....Osceola, Ia.
L. D. Berry, *M. M*... ....Osceola, Ia.
Elias Tonet, *M. C. B*................Osceola, Ia.
Des Moines & Ft. Dodge. 4-8½ g. 144 m. 13 lo. 350 c.
C. N. Gilmore, *Supt*.............Des Moines, Ia.
John McGrayel, *M. M*......Grand Junction, Ia.
E. A. Avery, *M. C. B* ....Grand Junction, Ia.
Det., Bay City & Alpena R. R. 3-2 g. 48 m. 5 lo. 227 c.
Milo Eastman, *Supt*..... ... East Tawas, Mich.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 39 lo. 696 c.
W. J. Spicer, *Gen. Man*... ....Detroit, Mich.
John S. Lorimer, *Storekeeper*....Detroit, Mich.
W. J. Morgan, *Supt*..............Detroit, Mich.
H. Roberts, *Mech. Supt*......Port Huron, Mich.
R. P. Baillie, *M. M*. ....Ft. Gratiot, Mich.
Det., Lansing & No'n R.-R. 4-8½ g. 222 m. 84 lo. 1027 c
John B. Mulliken, *Gen. Man*......Detroit, Mich.
Allan Bourn, *Pur. Agt*............Detroit, Mich.
Thos. M. Fish, *Gen. Supt*...........Ionia, Mich.
G. C. Watrous, *M. M. & C. B* ......Ionia, Mich.
Det., Mack. & Marq. R.R. 4-8½ g. 152 m. 16 lo. 1,112 c.
D. McCool, *Gen. Supt. & P. A.* Marquette, Mich.
W. J. Tench, *Pur. Agt*........Marquette, Mich.
John B. Wilson, *Mech. Supt*....Marquette, Mich.
Dorchester & Delaware R.R. (*See Penna. (4) Del. Div.*)
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, *Supt*..............Waverly, Ia.
W. S. Couch, *Pur. Agt*.......... Dubuque, Ia.
Duck River Valley R. R. (*See Nash., Chat. & St. L.*)
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 lo. 102 cars.
D. Thayer, *Gen. Supt*............Dunkirk, N. Y.
R. C. Moore, *Pur. Agt*...... .New York, N. Y.
J. C. Haggett *M. M. & C. B*.....Dunkirk, N. Y.

E

East Alabama Ry. 5 g. 22 m. 3 lo. 19 cars.
W. W. Barnes, *Supt*..............Opelika, Ala.
East Broad Top R. R. 3 g. 30 m. 7 lo. 260 cars.
A. W. Sims, *Supt* ....Orbisonia, Pa.
A. W. Greenwood, *M. M*.... ....Orbisonia, Pa.
East St. Louis & Carondelet Ry. 4-9 g. 4 lo. 27 c.
Joseph Hill, *Gen. Supt*......East St. Louis, Ill.
East Tenn. & Western North Car. R. R.
3 g. 34 m. 2 lo. 70 cars.
Thomas E. Matson, *Supt*..Elizabethton, Tenn.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,453 m. 173 lo. 3,670 cars.
Henry Fink, *V. P. & Gen. Man*. Knoxville, Tenn.
J. F. O'Brien, *Gen. Supt*.......Knoxville, Tenn.
J. E. Wilcox, *Pur. Agt*. ......Knoxville, Tenn.
East Tenn. Div. and No. Car. and Ohio Branches:
F. K. Huger, *Supt*...........Knoxville, Tenn.
B. J. Sitton, *M. M*..... . ....Knoxville, Tenn.
Jos. Armbruster, *M. C. B*....Knoxville, Tenn.
Alabama Div.: J. M. Bridges, *Supt*...Selma, Ala.
Simon Gay, *M. M*. .. .. Selma, Ala.
W. W. Pierce, *M. C. B*. ....Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, Jr., *Supt*..... Memphis, Tenn.
H. N. Burford, *M. M*... ....Memphis, Tenn.
Atlanta Div.: J. W. Fry, *Supt*......Atlanta, Ga.
W. A. Walden, *M. M*........ ....Atlanta, Ga.
J. H. Perkins, *M. C. B*. ....Atlanta, Ga.
Brunswick Div.: J. E. Mallory, *Supt*. .Macon, Ga.
East & West R. R. of Ala. 3 g. 110 m. 9 lo. 85 c.
John Postell, *Manager*......... Cedartown, Ga.
M. M. & C. B.......Cedartown, Ga
Eastern R. R. 4-8½ g. 283 m. 110 lo. 2,268 cars.
Payson Tucker, *Gen. Man*........Boston, Mass.
D. W. Sanborn, *Mast. of Trans*..Boston, Mass.
G. F. Hurd, *Pur. Agt*....... . ..Boston, Mass.
Amos Pilsbury, *S. M. P. & M*. ..E. Boston, Mass.
A. M. Waitt, *G. For. Car Dept*.....Salem, Mass.
Con'y Div.: J. W. Sanborn, *Supt*..Wolfboro J., N.H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 160 c.
H. W. Bates, *Man. & Pur. Agt*... Riverton, Ky.
H. W. Crawford, *M. M*....... ..Hunnewell, Ky.
Eastern (Maine) R. R. (*See Maine Central.*)
Eastern Shore R. R. 4-8½ g. 38 m. 3 lo. 9 c.
W. Thompson, *Supt*......... Princess Anne, Md.
F. Strattner, *M. M*......... Princess Anne, Md.
Elberton Air-Line R.R. (*See Rich. & Dan. N. G. Brs.*)
Elizabeth City & Norfolk R. R. (*See Norfolk So.*)
Elizabethtown, Lex. & Big Sandy R.R. (*See Ches. & O.*)
Elmira, Cortland & Northern R. R. 4-8½ g.
Geo. S. Sadler, *Supt*...............Elmira, N. Y.
Emmitsburg R. R. (*See Western Md.*)
Erie & Huron Ry. 4-8½ g. 40 m.
E. O. Bickford, *Gen Man*.........Toronto, Ont.
Erie & Pittsburg R. R. (*See Penna. Co.; (3) Div.*)
Etowah & Deaton's R. R. 3 g. 9 m.
D. M. Rogers, *Gen. Man*...........Etowah, Ga.
Eureka Springs Ry. 4-8½ g. 19 m. 1 lo. 9 cars.
Powell Clayton, *Gen. Man*. Eureka Springs, Ark.
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 125 cars.
B. Gilman, *Gen. Supt & Pur. Agt*..Eureka, Nev.
J. M. Crawford, *M. M*............Palisade, Nev.
A. S. Longley, *M. C. B*...... ...Palisade, Nev.
European & North American R. R. (*See Maine Cen.*)
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 lo. 98 c
H. L. Shepard, *Supt*.............Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 169 m. 26 lo. 973 c.
D. J. Mackey, *Gen. Supt*...... Evansville, Ind.
John Torrance, *M. M*.... ......Evansville, Ind.

F

Fitchburg R. R., 4-8½ g. 152 m. 100 lo. 3,430 cars.
John Adams, *Gen. Supt*...........Boston, Mass.
F. S. Pratt, *Pur. Agt* ....Boston, Mass.
Orlando Stewart, *Supt. M. P*......Boston, Mass.
W. A. Foster, *Asst. Supt. M. P*..Fitchburg, Mass.
J. W. Marden, *M. C. B* ... Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 346 m. 72 lo. 2,100 cars.
H. C. Potter, *Gen. Man*..... E. Saginaw, Mich.
D. Edwards, *Asst. Gen. Man*..E. Saginaw, Mich
G. G. Cook, *Pur. Agt*........E. Saginaw, Mich.
Sanford Keeler, *Gen. Supt*..E. Saginaw, Mich.
W. F. Potter, *Supt.* (E. Div.)..E. Saginaw, Mich.
M. V. Meredith, *Supt.* (W. Div.) E. Saginaw, Mich.
T. J. Hatswell, *M. M*...... .E. Saginaw, Mich.
R. McPherson, *M. C. B*.......E. Saginaw, Mich
Florida Ry. & Nav. Co. 5 g. 488 m. 31 lo. 397 c.
D. E. Maxwell, *Gen. Supt*... Fernandina, Fla.
R. V. Dohoney, *M. M. & C. B*. Fernandina, Fla.
Florida Southern Ry. 3 g. 91 m. 6 lo. 96 cars.
Sherman Conant, *Gen. Man*... ...Palatka, Fla.
Jas. D. Hollister, *Supt*............Palatka, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 26 m. 5 lo. 35 c.
Lawton Caten, *Supt*.. ...... Gloversville, N. Y.
G. V. Putman, *M. M*...... Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, *Supt. & P. A*. Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. (*See Minn. & St. L.*)
Franklin & Prov. & Hopkinton. 22 m.
E. T. Logee, *Supt* ....Milford, Mass.
Ft. Madison & No.-West'n Ry. 3 g. 45 m. 5 lo. 127 c.
S. B. Kenrick, *Supt. & Pur. Agt*. Ft. Madison, Ia
I. L. Lamb, *M. M. & C. B*..... Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 128 m. 10 lo. 250 c.
White Water R. R 4-8½ g. 65 m. 5 lo. 170 cars.
W. W. Worthington, *Gen. Supt*...Ft. Wayne, Ind.
T. H. Haberkorn, *M. M*.........Ft. Wayne, Ind.
Wm. Knight, *M. C. B*...........Ft. Wayne, Ind.
Ft. Worth & Denver City Ry. 4-8½ g. 114 m. 8 lo. 443 c.
C. L. Frost, *Gen. Supt* ......Fort Worth, Tex.
Freehold & New York Ry. 4-8½ g. 15 m. 4 lo. 40 c.
J. E. Ralph, *Supt. & Pur. Agt*..Keyport, N. J.
M. C. Mooney, *M. M*.... .... Freehold, N. J.
C. H. Snedeker, *M. C. B*...... Freehold, N. J.
Fulton County N. G. Ry. 3 g. 61 m. 4 lo. 168 cars.
A. C. Atherton, *Gen. Supt. & P. Agt*. Lewiston, Ill.

G

Gainesville & Dahlonega R. R. 3 g. 15 m.
W. P. Price, *Pres*..............Dahlonega, Ga.
Gainesville, Jefferson & Southern R.R. (*See Cen. of Ga*)
Gal., Harrisburg & San Antonio Ry. (*See Cen. Pac.*)
Galveston, Houston & Hend. R. R. (*See Mo. Pac. (5) Div.*)
Galveston, Sabine & St. Louis Ry.
4-8½ g. 15 m. 2 lo. 27 cars.
Brad. Barner, *Gen. Man*.... ..Longview, Tex.
Chas. H. Jewell, *Gen. Supt*.....Longview, Tex.
Geneva, Ithaca & Sayre R. R. (*See Lehigh Val.*)
George's Creek & Cumberland R. R.
4-9 g. 25 m. 6 lo. 212 cars.
J. A. Millholland, *Gen. Man*..Cumberland, Md.
Georgetown & Lane's R. R. 5 g. 36 m. 2 lo. 52 c.
G. W. Earle, *Gen. Supt*......Georgetown, S. C
Georgia R. R. 5 g. 307 m. 42 lo. 1,017 cars.
John W. Green, *Gen. Man*.........Augusta, Ga.
John S. Cook, *M. M*............... Augusta, Ga.
T. M. Preval, *M. C. B*......... ....Augusta, Ga.
Georgia Pacific Ry. 5 g. 218 m.
I. Y. Sage, *Gen. Supt*........Birmingham, Ala.
S. H. Purcell, *Div. Supt*.......Greenville, Miss.
G. H. Barnum, *Div. Supt*... ..Columbus, Miss.
J. A. Branigan, *M. M*.... . . .Greenville, Miss.
J. B. Shelton, *M. C. B* ...... .Greenville, Miss.
Gettysburg & Harrisburg R. R. 4-9 g. 21 m.
W. H. Woodward, *Supt*. Pine Grove Furnace, Pa.
Grand Haven R. R. (*See Chic. & W. Mich.*)
Grand Junction Ry. (*See Midland of Can.*)
Grand Rapids, Indiana & Mackinaw. (*See Gr. R. & I.*)
G'd Rap., Newaygo & L. S. R. R. (*See Chic. & W. M.*)
Grand Rapids & Indiana. 4-8½ g. 528 m. 52 lo. 1,724 c.
W. O. Hughart, *Gen. Man*. Grand Rapids, Mich.
W. R. Shelby, *Pur. Agt*....Grand Rapids, Mich.
S. D. Bradley, *M. M*...... Grand Rapids, Mich.
No'n Div.: J. M. Metheany, *Supt*. G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, *Supt*. Fort Wayne, Ind.
Grand Southern Ry. of New Brunswick.
4-8½ g. 82 m. 5 lo. 54 cars.
J. N. Greene, *Gen. Man*..... .St. George, N. B.
F. W. Holt, *Supt*... .... St. George, N. B.
Thomas Logan, *M. M*...... .St. George, N. B.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 lo. 357 c.
T. M. Williamson, *Supt. & P. A*..Gr. Tower, Ill.
Hugh Smith, *M. M. & C. B*....Grand Tower, Ill.
Grand Trunk Ry. 4-8½ g. 2,332 m. 660 lo. 16,330 c.
Joseph Hickson, *Gen. Man*.....Montreal, Can.
Jas. Stephenson, *Supt*......... Montreal, Can
Wm. Wainright, *Asst. Man*......Montreal, Can.
Mont. Divs.: W. J. Spicer, *Supt*. .Montreal, Can.
Jno. Taylor, *Gen. Storekeeper*. Montreal, Can.
Herbert Wallis, *Mech. Supt*...Montreal, Can.
Wm. McWood, *Supt. Car Dept*. Montreal, Can.
J. Haskoni, *Div. M. S* .. .. Richmond, P. Q.
Gt. West'n Div.: Chas. Stiff, *Supt*. Hamilton, Ont.
E. Baines, *Store Kpr*......... ..London, Ont.
C. K. Domville, *Mech. Supt*... .Hamilton, Ont.
C. F. Hanson, *Lo. For*...........London, Ont.
J. D. McIlwain, *Supt. Car Dept*..London, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 339 m. 103 lo. 1,191 c.
W. J. Spicer, *Gen. Man*........ Chicago, Ill.
W. H. Pettibone, *Supt*. ..Battle Creek, Mich.
A. Judd, *Pur. Agt*.........Fort Gratiot, Mich.
H. Roberts, *Mech. Supt*....... Detroit, Mich.
Midland of Can. 4-8½ g. 471 m. 44 lo. 1,423 c.
W. B. Ferguson, *Supt* ....Peterboro, Ont.
J. D. Barnet, *Mech. Supt*.... Peterboro, Ont.
Grand Trunk, Georgian Bay & Lake Erie Ry. (*See G. T.*)
Great Western Ry. (*See Grand Trunk; G. W. Div.*)
Green Bay, Winona & St. Paul R. R.
4-8½ g. 250 m. 19 lo. 623 cars.
Timothy Case, *Gen. Man. & P. A.* Green Bay, Wis.
A. Fenwick, *M. M*........... Ft. Howard, Wis.
Green Cove Spring & Melrose R.R. 3 g. 32 m. 1 lo. 11 c.
S. Ackley, *Pres*.... ....Philadelphia, Pa.
Greenwich & Johnsonville Ry. 4-8½ g. 15 m. 1 lo. 7 c.
J. H. Thompson, *Supt* ... ...Greenwich, N. Y.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 536 m. 51 lo. 1,400 c.
Webster Snyder, *Gen. Man*..Galveston, Texas.
Jno. W. Thorne, *Pur. Agt*....Galveston, Texas.
W. H. Reilly, *M. M. & M. C. B*..Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 74 c.
M. D. Monserrate, *Supt. & Pur. Agt*. Cuero, Tex.
James Mooney *M. M*....... .. Cuero, Texas.

H

Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,906 c.
J. F. Barnard, *Gen. Man* .... Chicago, Ill.
S. E. Crance, *Gen. Supt* ... .Hannibal, Mo.
Wm. Irving, *Pur. Agt*............Hannibal, Mo.
N. Paradise, *Supt. M. P. & C. D*..Hannibal, Mo.
Chas. Coller, *For. Car Dept*. ....Hannibal, Mo.
Hanover Branch R. R. 4-8½ g. 8 m. 2 lo. 18 cars.
E. Y. Perry, *Supt*........South Hanover, Mass.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 74 m. 10 lo. 140 cars.
H. D. Scott, *Gen. Supt*.........Gettysburg, Pa.
John J. Bingley *M. M*.......... ....Hanover, Pa.
Jas. Harthorn, *M. C. B*....... ...Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 35 m. 3 lo. 35 c.
R. H. Middleton, *Supt*.....Boiling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 47 m. 9 lo. 196 c.
O. M. Shepard, *Asst. Supt*.... New Haven, Ct.
John Henry, Jr., *M. M*.........Hartford, Conn.
Hartford & Conn. W'n R.R. 4-8½ g. 110 m. 16 lo. 495 c.
John F. Jones, *Supt*....... .. . .Hartford, Ct.
J. C. Barton, *M. M*.................Hartford, Ct.
Hartwell R. R. (*See Rich. & Dan.; N. G. Brs.*)
Hecla & Torch Lake R. R. 4-1 g. 5 m. 5 lo. 165 cars.
W. A. Childs, *Gen. Man*........Calumet, Mich.
Herkimer, Newport & Poland Ry.
3-6 g. 17 m. 2 lo. 24 cars.
Albert Wilber, *Supt*...........Herkimer, N. Y.
Hobart & Manistee River R. R. 3 g. 9 m. 2 lo. 42 c.
H. W. Marsh, *Supt*. ....Hobart, Mich.
Hot Springs R. R. 3 g. 25 m. 3 lo. 37 cars.
J. N. Conger, *Supt*... ....Hot Springs, Ark.
L. Finlay, *M. M*..................Malvern, Ark.
Housatonic R. R. 4-8½ g. 126 m. 25 lo. 571 cars.
W. H. Yeomans, *Supt*...........Bridgeport, Ct.
D. S. Draper, *Pur. Agt*..........Bridgeport, Ct.
N. Slingland, *M. M*............Falls Village, Ct.
J. J. Ferris, *M. C. B*....... ...Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 16 miles.
S. L. Werden, *V. P. & Gen. Man*. Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 150 m. 10 lo. 570 c.
Paul Bremond, *Pr. & Pur. Agt*..Houston, Tex.
E. L. Bremond, *Gen. Man*........Houston, Tex.
B. O. Diffey, *M. M*.............. .Houston, Tex.
C. F. Schelewa, *M. C. B*. ......Houston, Texas.
Houston & Tex. Cen. Ry. 4-8½ g. 750 m. 78 lo. 2,526 c.
J. Waldo, *V. Pr. & Gen. Man*....Houston, Tex.
A. H. Swanson, *Gen. Tr. Man*.....Houston, Tex.
Pur. Agt........New York, N. Y.
L. C. Noble, *Gen. M. M*..........Houston, Tex.
James McGee, *M. C. B*.. ....Houston, Tex.
So. & Wn. Divs.: M. G. Howe, *Supt*. Houston, Tex.
No. & Ml. Divs.: G. A. Quinlan, *Supt.*, and
C. H. Burns, *Asst. M. M*..... .Corsicana, Tex.
No.-Wn. Div.: Donald Allen, *Supt*.... Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 113 m. 18 lo. 80 cars.
F. O. Wyatt, *Gen. Man*...........Clarinda, Ia.
C. H. Warren, *Supt*.......... . ..Clarinda, Ia.
W. B. Snyder, *M. M*. ....Shenandoah, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 62 m. 18 lo. 69 c.
Geo. F. Gage, *Gen. Man*. ... .Huntingdon, Pa.
Samuel B. Knight, *Pur. Agt*..Philadelphia, Pa.
William Barkla *M. M*...... .....Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,928 m. 334 lo. 8,565 c.
E. T. Jeffery, *Gen. Supt* .... .Chicago, Ill.
O. Ott, *Pur. Agt*......................Chicago, Ill.
Henry Schlacks, *Supt. of Mach*....Chicago, Ill.
W. B. Snow, *M. M. Car Works*.....Chicago, Ill.
(1) Ill. & Ia. Divs.: C. A. Beck, *Supt*.....Chicago, Ill.
Chic. Div.: T. J. Hudson, *Supt*. ...... Cairo, Ill.
Wm. Renshaw, *M. M* ....Chicago, Ill.
Mid. Div.: H. L. Frisbie, *Supt*.. .... .Pontiac, Ill.
Spring. Div.: W. Wilkinson, *Supt*. Springfield, Ill.
W. B. McKenna, *M. M*... . ...Clinton, Ill.
No'n Div.: J. C. Jacobs, *Supt*.........Amboy, Ill.
J. B. Edams, *M. M*............ ...Amboy, Ill.
Ia. Div.: M. Gilleas, *Supt*....... ... Dubuque, Ia.
Thos. W. Place, *M. M*....... . .Waterloo, Ia.
(2) So. Divs.: C. M. Sheafe, *Supt* ...New Orleans, La.
Geo. W. Baxter, *M. C. B* ..McComb City, Miss.
So. Div.: J. M. Turner, *Supt*. do.
M. M... McComb City, Miss.
Miss. Div.: J. G. Mann, *Supt*......Jackson, Tenn.
J. F. White, *M. M*........Water Valley, Miss.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
D. H. Conklin, *Rec. & Gen. Man*......Decatur, Ill.
O. E. Grady, *Train Mast*...........Decatur, Ill.
Frank Young, *For. Shops*.............Paris, Ill.
Illinois & St. Louis R. R. 4-8½ g. 19 m. 10 lo. 450 c.
C. H. Sharman, *Gen. Supt. & P. A.* St. Louis, Mo.
D. J. Timlin, *M. M*... ....Belleville, Ill.
Charles Rothe, *M. C. B*.... .. E. St. Louis, Ill
Indiana, Bloomington & Western Ry.
4-8¾ g. 826 m. 112 lo. 4,067 cars.
C. E. Henderson, *Gen. Man*. Indianapolis, Ind.
I. H. Wilson, *Gen. Supt* .....Indianapolis, Ind.
H. C. Norton, *Pur. Agt*...... Indianapolis, Ind.
Jos. S. Porter, *M. M*...............Sandusky, O.
B. Warren, *Gen. M. M*........Indianapolis, Ind.
Peoria Div.: E. Hiserodt, *M. M* .... Urbana, Ill.
St. Louis Div.: John King, *M. M.* Indianapolis, Ind.
Ohio So. Rd.: W. H. Van Tassall, *S.* Springfield, O.
A. J. Sanborn, *M. M* .... Springfield, O.
Indiana, Illinois & Iowa R.R. 4-8½ g. 104 m. 5 lo. 83 c.
F. M. Drake, *Gen. Man*..... ....Kankakee, Ill.
T. P. Shonts, *Gen. Supt*..........Kankakee, Ill.
R. C. Ackley, *M. M*...............Kankakee, Ill.
Indiana & Illinois Southern Ry. 3 g. 91 m. 3 lo. 69 c.
W. C. Lyon, *Gen. Man. & P. Agt*. Robinson, Ill.
J. S. Pickering, *M. M. & C. B*.. Effingham, Ill.
Indianapolis, Decatur & Springfield Ry.
(*See Ind., Bloom. & West'n.*)
Indianapolis & Evansville Ry. 4-8½ g. 54 m.
D. J. Mackey, *Supt* ... .Evansville, Ind.
Indianapolis & St. Louis R. R. (*See C., C., C. & I.*)
Indianapo. & Vincennes R. R. (*See Penna. Co. (8) Div.*)
Intercolonial Ry. 4-8½ g. 846 m. 135 lo. 4,500 cars.
David Pottinger, *Chief Supt*.....Moncton, N. B.
T. V. Cook, *Gen. Storekeeper*...Moncton, N. B.
H. A. Whitney, *Mech. Supt*......Moncton, N. B
Ewd. D. Shaffer, *M. C. B* ....Moncton, N. B.
M. & C. Div.: J. E. Price, *Supt*..Cambellton, N. B.
Hal. & St. J. Div.: J. J. Wallace, *Supt*..Truro, N. B
Q. & St. F. Div.: A. McDonald, *Supt*. Riv. du Loup, Q.
International Ry. 4-8½ g. 69 m. 7 lo. 12 cars.
D. E. McFee, *Supt* ....Sherbrooke, Que
J. Ruelle, *M. M*....... ......Sherbrooke, Que.
W. Charest, *M. C. B*..........Sherbrooke, Que.
International & Gt. N'n R. R. (*See Mo. Pac.; (5) Div.*)
Iowa Falls & Sioux City R. R. (*See Ill. Cen.*)
Iron Ry. (*See Tol., Cin. & St. L.*)
Iron Mountain & Helena R. R. (*See Mo. Pac.; (4) Div.*)
Ithaca, Auburn & Western Ry. (*See Southern Cen.*)

J

Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 69 c.
E. S. Greenleaf, *Supt*..........Jacksonville, Ill.
Ira F. Petrie, *M. M*............Jacksonville, Ill.
Jacksonville, St. Augustine & Halifax River Ry.
3 g. 76 m. 3 lo. 27 cars.
W. L. Crawford, *Gen. Man*..Jacksonville, Fla.
H. S. Ming, *Supt*. .. ..Jacksonville, Fla.
Jacksonv., Pensacola & Mob. (*See Fla. Cent. & W.*)
Jacksonville, Tampa & Key West Ry. 5 g. 56 m.
G. W. Bentley, *Gen. Man*. ..Jacksonville, Fla.
M. R. Moran, *Supt*............Jacksonville, Fla.
Jamesville & Washington R. R. (*See Norfolk So'n.*)
Jeffersonv'l, Madison & Indpls. R. R. (*See (9) Pa. Co.*)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, *Manager* ...Jersey City, N. J.
Jersey City & Bergen R. R. 4-8½ g. 6 m. 2 lo. 13 c.
T. M. Sayre, *Gen. Supt*........Jersey City, N. J.
Jersey Shore, Pine Creek & Buff. Ry. (*See Phil. & R.*)
Junction & Breakwater R.R. (*See Del., Md. & Va.*

K

Kaaterskill R. R. 3 g. 8 m.
J. H. Jones, *Supt*..... ....Rondout, N. Y.
Kankakee & Seneca R.R. (*See Cin., Ind., St. L. & Chi.*)
Kansas Central R. R. (*See Union Pacific.*)
Kansas City, Fort Scott & Gulf R. R.
4-8½ g. 389 m. 75 l. 2,037 c.
Geo. H. Nettleton, *Gen. Man*..Kansas City, Mo.
L. W. Towne, *Supt*..... ......Kansas City, Mo.
H. P. Jacques, *Pur. Agt*..... Kansas City, Mo.
J. S. McCrum, *M. M* ....Kansas City, Mo.
A. N. Montier, *M. C. B*.... ....Kansas City, Mo.
Kansas Cy, Lawrence & So. Kan. (*See At., Top. & S. F.*)
Kansas City, Springfield & Memphis R. R.
4-8½ g. 283 m. 10 lo. 456 cars.
George H. Nettleton, *Pres*.... Kansas City, Mo.
L. W. Towne, *Supt*........... Kansas City, Mo.
H. P. Jacques, *Pur. Agt*.......Kansas City, Mo.
J. S. McCrum, *M. M*......... ..Kansas City, Mo.
A. H. Montier, *M. C. B*........Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ & 3 g. 368 m. 41 lo. 1,148 c.
J. F. Barnard, *Gen. Supt*.........St. Joseph, Mo.
J. R. Hardy, *Supt* .... St. Joseph, Mo.
Wm. Irving, *Pur. Agt*... ....Chicago, Ill.
F. A. Chase, *M. M*......... ..... St. Joseph, Mo.
Thos. Aylesbury, *G. For. Car Dep*. St. Joseph, Mo.
Kansas City & Southern Ry. 4-8½ g. In progress.
Wm. Bailey, *Pres*............Kansas City, Mo.
Kansas Coal Belt R. R. 4-8½ g. In progress.
C. H. Malin, *Gen. Man*.... ....Girard, Kan.
F. A. Hill, *Supt*...................Girard, Kan.

American Wire Nail Co.,
COVINGTON, KENTUCKY,
MANUFACTURERS EXCLUSIVELY OF

WIRE NAILS.

ESTABLISHED 1875.
INCORPORATED 1876.
J. L. STEPHENS, President.
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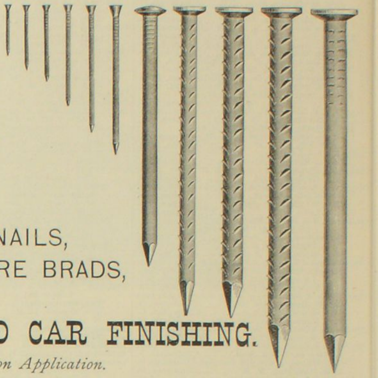
B. H. GEDGE, Secretary.

FLAT, OVAL, OR DEPRESSED HEAD.
BLUED, BLACK OR BRIGHT.
BARBED STEEL WIRE NAILS,
AND STEEL WIRE BRADS,
FOR
CAR SIDING, CAR ROOFING AND CAR FINISHING.
Illustrated Catalogue and Price List sent on Application.



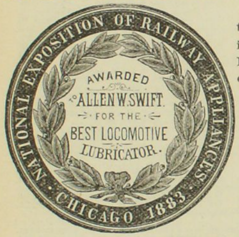
THE "SWIFT" AUTOMATIC LUBRICATOR.
A PERFECT MACHINE FOR THE INTERNAL LUBRICATION OF THE
LOCOMOTIVE, MARINE & STATIONARY ENGINES.

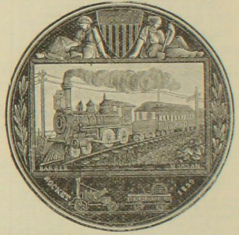
This device delivers any desired quantity to each cylinder POSITIVELY, and its feed-rate remains unchanged with the Engine at FULL STROKE, THROTTLED or REVERSED.

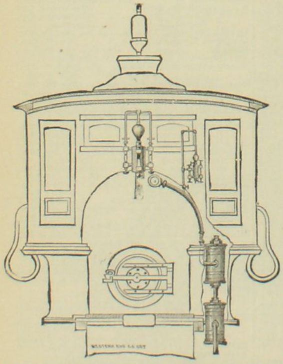
Will feed any ordinary Lubricant from the lightest oils to the
HARDEST TALLOW
IN THE COLDEST WEATHER.

Positive Feed Flash "Sight."
NO EXTERNAL OR INTERNAL PIPES,
NO GLASS TUBES OR LOOSE JOINTS.
Approved by the Eastern and Western R. R. Association.

NOW IN USE ON THE LEADING RAILROADS IN THE COUNTRY, INCLUDING
Pennsylvania R. R., Union Pacific R. R., New York, West Shore & Buffalo, Chicago & Alton, Lehigh Valley, Delaware, Lackawanna & Western R. R.
CORRESPONDENCE SOLICITED.
"SWIFT" LUBRICATOR COMPANY, ELMIRA, N. Y.







THE DETROIT LUBRICATOR COMPANY'S

SIGHT FEED LUBRICATORS,

For Locomotive Cylinders and Air-Pumps.

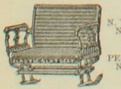
The attention of railroad men is invited to the Detroit Lubricator Co.'s Patent Sight Feed Lubricators, for oiling locomotive valves and cylinders, and the Westinghouse Air Pump. Both cups are placed within the cab. The valve cup has a double sight feed, each of which is connected to the right and left hand steam chests, by means of the so-called "tallow pipes," running beneath the jacket, thus securing *independent lubrication to each steam chest and cylinder from the one cup.* The oil is shown passing in drops through each sight feed glass to the parts to be lubricated, and can be regulated to feed fast or slow. *The feed is regular and continuous, going up or down grade, whether pressure is on or off,* thus securing perfect lubrication at all times. What is said in reference to the valve cup, is equally true in regard to our lubricator for the Westinghouse Pump. By the use of these cups, the saving in wear and tear of machinery and the additional power gained is simply wonderful, as is proved by actual results.*

We solicit a practical test, and will send one or more valve and air-brake cups to responsible parties on 30 days' trial. Details and drawings showing manner of attachment and prices furnished on application.

DETROIT LUBRICATOR CO.
Office: 129 GRISWOLD ST., - - - DETROIT, MICH.

* Numerous examples can be furnished where engines have run *two years and over, without having had their valves faced.* The average mileage for the air-brake lubricator is 500 to 1,500 miles to the ½ pint, and examples can be given where this mileage has been greatly exceeded, among which is one of 1,612 *miles with a ½ pint* of oil on a daily run of 208 miles with 64 stops. This pump has run *nine months without having had 25 cents expended on it for repairs.*

HALE & KILBURN MANUFACTURING COMP'Y,
48 AND 50 NORTH SIXTH STREET, PHILADELPHIA, PA.,



ELASTIC SLAT SEAT.

REFERENCES.
N. Y. C. & H. R. R. CO.
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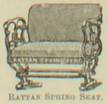
ILL. CENTRAL R. R.
PULLMAN P. C. CO.
PENN. R. R. CO.
N. Y. & N. ENG'D R. R.
BALT. & O. R. R.
AND ONE HUNDRED OTHERS.



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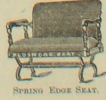
EXTENSIVE MAKERS
OF
PATENTED CAR SEATS
AND
SPRINGS,



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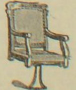
ESTIMATES,
CIRCULARS
AND
SAMPLES FURNISHED
ON
APPLICATION.



PARLOR CAR CHAIR.

Kansas & Gulf Short Line R. R. 33 m. 2 lo. 32 cars.
Eli Culverhouse, *Gen. Man*..........Tyler, Tex.
V. K. Stevenson, *Pur. Agt*.....New York, N. Y.
Kendall & Eldred R. R. (*See Buf., N. Y. & Phil.*)
Kent Northern Ry. 4-8½ g. 27 m. 2 lo. 16 cars.
J. C. Brown, *Gen. Man*.....Richibucto, N. B.
Kentucky Central R. R. 4-9 g. 184 m. 22 lo. 640 cars.
G. W. Bender, *Supt*.........Covington, Ky.
A. H. Watts, *M. of Mach*.......Covington, Ky.
M. C. B........Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 lo. 52 c.
Geo. B. Harper, *Supt. & P. A*..Mt. Sterling, Ky.
S. P. Hatfield, *M. M*..........Mt. Sterling, Ky.
Keokuk & Des Moines R.R. (*See Chi., R. I. & Pac.*)
Kinzua R. R. (*See Buf., N. Y. & Phil.*)
Kingston & Pembroke Ry. 4-8½ g. 90 m. 9 lo. 214 c.
B. W. Folger, *Supt*..............Kingston, Ont.
J. H. Taylor, *Pur. Agt*..........Kingston, Ont.
J. H. Taylor, *M. M*..............Kingston, Ont.
Knox & Lincoln R. R. 4-8½ g. 49 m. 5 lo. 103 cars.
C. A. Coombs, *Supt*...................Bath, Me.
Wm. A. Field, *M. M*...................Bath, Me.
C. L. Turner, *M. C. B*................Bath, Me.
Knoxville & Augusta R. R. 5 g. 16 m. 2 lo. 34 cars.
R. N. Hood, *Gen. Man. & P. Agt*. Knoxville, Tenn
J. M. Hood, *Supt*..............Knoxville, Tenn.

L

Lackawanna & Pittsburgh R. R. 3 g. 97 m.
R. M. Patterson, *Gen. Supt*.....Angelica, N. Y.
Lake Champlain & Moriah R.R. 4-8½ g. 8 m. 8 lo. 222c.
E. B. Hedding, *Supt*.........Port Henry, N. Y.
Lake Erie & Western Ry. 4-8½ g. 388 m. 53 lo. 1,701 c.
J. H. Cheney, *Gen. Man*..... Bloomington, Ill.
D. S. Hill, *Gen. Supt*..........Bloomington, Ill.
T. H. Perry, *Pur. Agt*..........Bloomington, Ill.
H. L. Cooper, *Supt. of Equipment*....Lima, O
Lake George & Muskegon River R. R.
4-8½ g. 20 m. 4 lo. 79 cars.
W. S. Gerrish, *Gen. Man*... Muskegon, Mich
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,340 m. 547 lo. 17,115 cars.
John Newell, *Gen. Man*..........Cleveland, O.
P. P. Wright, *Gen. Supt*.............Cleveland, O
L. G. Higgins, *Pur. Agt*...........Cleveland, O.
G. W. Stevens, *Supt. M. P*........Cleveland, O.
John Kirby, *Gen. M. C. B*.........Cleveland, O.
East'n Div.: C. B. Couch, *Supt*.....Cleveland, O.
J. S. Graham, *M. M*............Buffalo, N. Y.
A. C. Robson, *M. C. B*..........Buffalo, N. Y.
L. O. Gassett, *M. M*.............Cleveland, O.
J. Withycombe, *M. C. B*.........Cleveland, O.
Frank. Div.: G. H. McIntire, *Supt*. Youngstown, O.
Toledo Div.: Thos. Flesher, Jr., *Supt*. Cleveland, O.
J. M. Sanborn, *M. M*..............Norwalk, O.
W. O. Smith, *M. C. B*........... Norwalk, O.
Mich. Divs.: J. E. Curtis, *Supt*......... Toledo, O.
Det. Brs.: T. J. Charlesworth, *Supt*. Detroit, Mich.
Lansing, Ypsilanti & Ft. Wayne Branches.
W. H. Caniff, *Supt*............Hillsdale, Mich.
Western Div.: A. G. Amsden, *Supt*...Chicago, Ill.
W. L. Gilmore, *M. M*............Elkhart, Ind.
Frank O. Bray, *M. C. B*.........Adrian, Mich.
Gr. Rap. Br.: M. E. Wattles, *Supt*. Kalamazoo, Mich.
Lake Tahoe R. R. 3 g. 10 m. 3 lo. 49 cars..
D. L. Bliss, *Gen. Man*...........Carson, Nev.
John T. Rogers, *Gen. Supt*...... Carson, Nev.
Geo. R. Lindsay, *M. M*............Carson, Nev.
Leavenworth, Topeka & So. W'n Ry. (*See A. T. & S. F.*)
Lebanon Springs R. R. 4-8½ g. 58 m. 5 lo. 44 c.
W. C. Alstyne, *Gen. Man*.......Albany, N. Y.
W. H. Hawkins, *Pur. Agt*.......Albany, N. Y.
Geo. Tefft, *M. M*................Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 495 m. 392 lo. 36,998 c.
H. S. Goodwin, *Gen. Supt*.......Bethlehem, Pa.
W. C. Alderson, *Pur. Agt*.....Philadelphia, Pa.
John I. Kinsey, *M. M*............So. Easton, Pa.
John S. Lentz, *M. C. B*.........Packerton, Pa.
N. J. Div.: Jas. Donnelly, *Supt*. Perth Amboy, N. J.
Coal Rds.: J. I. Blakeslee, *Supt*. Mauch Chunk, Pa.
D. Clark, *M. M*.....................Hazleton, Pa.
John Campbell, *M. M*...............Delano, Pa.
B. M. Div.: A. G. Brodhead, *S*..Mauch Chunk, Pa.
P. Hofecker, *M. M*...............Weatherly, Pa.
Wy. Div.: A. Mitchell, *S. & M. M*. Wilkesbarre, Pa.
Pa. & N. Y.: and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Gen. Supt*.........Sayre, Pa.
J. N. Weaver, *M. M*.................. Sayre, Pa.
Lehigh & Hudson River Ry. 4-8½ g. 63 m. 8 lo. 350 c.
Grinnell Burt, *Gen. Man*.........Warwick, N. Y.
N. L. Furman, *Supt*..........Warwick, N. Y.
John Sayre, *Pur. Agt*..........Warwick, N. Y.
N. L. Furman, *Supt*..........Warwick, N. Y.
S. Mills, *M. M*.....................Warwick, N. Y.
Lehigh & Lackawanna and Lehigh & Susquehanna R. Rs. (*See Phil. & Read.; N. J. Cen. Div.*)
Levis & Kennebec R. R. (*See Quebec Cen.*)
Litchfield, Carrollton & Western R. R. 4-8½ g. 22 m.
H. S. Carroll, *Prest. & G. Man*..Carrollton, Ill.
Ligonier Valley R. R. 4-9 g. 11 m. 2 lo. 22 cars.
Thos. A. Mellon, *Gen. Manager*....Pittsburg, Pa.
Geo. Senft, *Supt. & P. Agt*.........Latrobe, Pa.
Little Miami R. R. (*See Penna. Co.'s Rds.; (8) Div.*)
Little Rock, Miss. River & Texas Ry.
4-8½ g. 170 m. 12 lo. 299 cars.
H. Wood, *Gen. Man*.........Little Rock, Ark.
F. A. Lister, *Gen. Supt*........Little Rock, Ark.
F. Hufsmith, *M. M. & C. B*...Arkansas City, Ark.
Little Rock & Fort Smith. 4-8½ g. 170 m. 13 lo. 360 c
Hy. Wood, *Gen. Man*..........Little Rock, Ark.
F. A. Lister, *Gen. Supt*.......Little Rock, Ark.
F. Hufsmith, *M. M. & M. C. B*.....Argenta, Ark.
Little Saw Mill Run R. R. 3 & 4-8½ g. 8 m. 4 lo. 327 c.
T. Hartley, *Gen. Man*..........Banksville, Pa.
Long Island R. R. 4-8½ g. 352 m. 92 lo. 953 cars.
I. D. Barton, *Gen. Supt*..Long Island City, N. Y
Benj. Norton, *Pur. Agt*..Long Island City, N. Y.
C. A. Thompson, *M. M*. Long Island City, N. Y.
Longview & Sabine Valley R. R. (*See Gal. Sab. & St. L.*)
Louisiana W'n R. R. (*See Cen. Pac.; G., H. & S. A. Div.*)
Louisville, Cin. & Lexington R. R. (*See Louis. & N.*)
Louis., Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 1,032 c.
Geo. T. Evans, *Gen. Man*.......Louisville, Ky.
C. F. Dalton, *Gen. Supt*.........Louisville, Ky.
F. P. Boatman, *M. M*...........Evansville, Ind.
Louisville, New Albany & Chicago Ry.
4-8½ g. 470 miles 56 lo. 3,700 cars.
John B. Carson, *Gen. Supt*.......Chicago, Ill.
T. L. Dunn, *Gen. Supt*.............Chicago, Ill.
H. O. Nourse, *Pur. Agt*...........Chicago, Ill.
Josiah Bettis, *M. M. & C. B*...New Albany, Ind.
C. C. F. Bent, *Supt. Trans*.......Lafayette, Ind.
Louisville, New Orleans & Tex. Ry. 450 m. In progress.
Jas. M. Edwards, *Gen. Man*...Vicksburg, Miss.
E. D. Anderson, *M. M*.........Vicksburg, Miss.
John Bradley, *Div. Supt*......New Orleans, La.
Louisville & Nashville R. R.
5 g. 2,186 m. 380 lo. 12,197 cars.
J. T. Harahan, *Gen. Man*........Louisville, Ky.
W. P. Harris, *Supt*..............Louisville, Ky.
P. P. Huston, *Pur. Agt*..........Louisville, Ky.
Reuben Wells, *Supt. Mach*..... Louisville, Ky.
Louisv., Cin. & Lex. Divs.;
J. G. Metcalf, *Supt. Trans*......Louisville, Ky.
P. Leeds, *M. M*...................Louisville, Ky.
J. W. Luttrell, *M. M*..........Louisville, Ky.
J. G. Clifford, *M. M.* (2d & C. Div.). Bowling Grn. Ky.
Henderson Div.: J. Geddes, *Supt*. Henderson, Ky.
W. P. Pike, *M. M*..............Nashville, Tenn.
Nash. & D. Div.: J. Geddes, *Supt*. Nashville, Tenn.
S. & N. A. Div.: *Supt*...Birmingham, Ala.
C. W. White, *M. M*.........Birmingham, Ala.
Mob. & M.; N. Div. Pens. & Sel.; Sl. & Mont. R. Rs.:
M. S. Belknap, *Supt*..........Montgomery, Ala.
J. N. Hall, *M. M.* (Mont. Shops). Montgomery, Ala.
N. O. Div.: O. M. Dunn, *Supt*....New Orleans, La.
Wm. Adair, *M. M*..................Mobile, Ala.
Memp. Div.: W. Colcamp, *Supt*. Memphis, Tenn.
J. V. Slusser, *M. M*.............Memphis, Tenn.
St. L. Div.: C. O. Parker, *Supt*. Montgomery, Ala.
Thos. Walsh, *M. M*............Mt. Vernon, Ill.
Pensacola and So. Div. Pens. & Selma Rds.:
E. O. Saltmarsh, *Supt*..........Pensacola, Fla.
W. D. Robb, *M. M*...............Pensacola, Fla.
Louisville & Wadley R. R. 5 g. 10 m. 1 lo. 5 c.
J. H. Wilkins, *Supt. & Pur. Agt*. Louisville, Ga.

M

Macon & Brunswick R. R.
(*See E. Tenn., Vir. & Ga.; At. & Ga. Divs.*
Maine Central R. R. 4-8½ g. 465 m. 59 lo. 1,335 c.
Payson Tucker, *Gen. Man*........Portland, Me.
Ira K. Russell, *M. M*........... Waterville, Me.
C. H. Kenison, *M. C. B*............Augusta, Me.
Eastern Maine. 3 g. 19 m. 2 lo. 40 c.
L. L. Lincoln, *Supt*.............Portland, Me.
Manchester & Keene R. R. 4-8½ g. 30 m. (*See Concord.*)
Manchester & Lawrence R. R. (*See Concord.*)
Manchester & North Weare R. R. (*See Concord.*)
Manhattan Ry. 4-8½ g. 32 m. 228 lo. 652 pass. c.
Frank K. Hain, *Gen. Man*.....New York, N. Y.
W. T. Goundie, *Supt. Trans*. .New York, N. Y.
T. W. Peeples, *M. M*..........New York, N. Y.
H. A. Webster, *M. C. B*........New York, N. Y.
Manhattan, Alma & Burlingame Ry. (*See A., T. & S. F.*)
Manitoba Southwestern Colonization Ry.
4-8½ g. 52 m. 3 lo. 125 cars.
J. M. Eagan, *Gen. Supt*.........Winnipeg, Man.
Chas. Newell, *M. M*.............Winnipeg, Man.
Marietta & Cincinnati R. R. (*See Cin. Wash. & Balt.*)
Marietta & North Georgia R. R. 3 g. 60 m. 3 lo. 7 c.
J. B. Glover, *Supt. & P. Agt*..... Marietta, Ga.
E. A. Withers, *M. M*.............Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g. 100 m. 42 lo. 2,530 cars.
John Hornby, *Gen. Man*.......Marquette, Mich.
M. B. McGee, *Pur. Agt*.......Marquette, Mich.
W. A. Thompson, *M. M*.......Marquette, Mich.
H. D. Lyons, *M. C. B*.........Marquette, Mich.
Maryland Central R. R. 3 g. 27 m. 4 lo. 56 cars.
S. G. Boyd, *Supt*................Baltimore, Md.
Marquette & Western.
D. McCool, *Gen. Supt*........Marquette, Mich.
W. J. Tench, *Pur. Agt*........Marquette, Mich.
Massachusetts Central R. R. 4-8½ g. 48 m. 5 l. 81 c.
E. G. Allen, *Supt. & Pur. Agt*....Boston, Mass.
E. A. Walker, *M. M*........So. Sudbury, Mass.
McComb, Deshler & Toledo R. R.
(*See Cin., Ham. & Day.; D. & M. Div.*)
Meadville Ry. (*See Penna. Co.'s Rds.; (2) Div.*)
Memphis & Charleston R. R. (*See E. Tenn. Va. & Ga.*.
Memphis & Lit. Rock R. R. 5 g. 135 m. 14 lo. 299 c.
R. Fink, *G. Man. & P. A*......Little Rock, Ark.
H. G. Fleming, *Supt*..........Memphis, Tenn.
Thos. Rennell, *M. M*..............Argenta, Ark.
T. Rennell, *M. C. B*..............Argenta, Ark.
Mexican Ry. 4-8½ g. 293 m. 42 lo. 616 cars.
E. W. Jackson, *Gen. Man*........Mexico, Mex.
Mexican Central Ry. 4-8½ g. 680 m. 73 lo. 818 c.
Theo. Nickerson, *Pur. Agt*......Boston, Mass.
D. B. Robinson, *Gen. Man*.......City of Mexico.
D. MacKenzie, *Gen. Supt*.......City of Mexico.
J. H. O'Brien, *M. M*............City of Mexico.
G. T. Jarvis, *Div. Supt*.........City of Mexico.
J. H. Smith, *Div. Supt*...............Silao, Mex.
Wm. Davis, *Div. Supt*............Jimulco, Mex.
E. E. Comfort, *Div. Supt*..Paso del Norte, Mex.
F. W. Johnstone, *Supt. R. S*....City of Mexico.
E. P. Simpson, *M. M*...........City of Mexico.
A. Hender, *M. M*....................Calera, Mex.
C. F. Stewart, *M. M*..................Silao, Mex.
W. L. Wallace, *M. M*.............Jimulco, Mex.
J. G. McCuen, *M. M*..........Chihuahua, Mex.
San Blas Div.: C. E. Payne, *Supt*..San Blas, Mex.
1st Div.: G. T. Jarvis, *Supt*..... City of Mexico.
2d Div.: J. H. Smith, *Supt*.......... Silas, Mex.
3d Div.: Wm. Davis, *Supt*....... Jimulco, Mex.
4th Div.: R. E. Comfort, *Supt*. Paso Del Norte, Mex.
Mexican National Ry. 3 g. 766 m. 50 lo. 1,283 c.
Texas Mexican Ry. 3 g. 171 m. 10 lo. 212 c.
R. C. Peebles, *Supt*...........Mexico, Mex.
W. F. Baldwin, *Asst. Supt*.......Laredo, Tex.
Galv. Div. T. M. Ry.: M. Quin, *Supt*. Galveston, Tex
No. Div. Mex. Nat. Ry. & So. Div. Tex.-Mex. Ry.
C. A. Merriam, *Supt*........ Laredo, Texas.
Tho. Milan, *M. M*..........Corpus Christi, Tex.
So. Div. M. N. Ry.: W. E. Lewis, *Supt*. Mexico, Mex.
J. M. Winslow, *M. M*..............Mexico, Mex.
Mat. Div.: F. E. Butterfield, *Supt*. Matamoras, Mex
Mexican, Oriental, Inter-Oceanic & International R. R. 1,400 miles. In progress.
G. M. Dodge, *Pres*. 195 B'way, New York, N. Y.
Michigan Cen. R. R. 4-8½ g. 1,485 m. 357 lo. 11,284 c.
H. B. Ledyard, *Pres. & Gen. Man*. Detroit, Mich.
E. C. Brown, *Gen. Supt*.........Detroit, Mich.
Robert Miller, *Asst. Gen. Supt*...Detroit, Mich.
Allan Bourn, *Pur. Agt*............Detroit, Mich.
S. H. Edgerly, *Gen. M. M*.......Jackson, Mich.
(1) Lines West of Detroit River:
E. C. Brown, *Gen. Supt*........Detroit, Mich.
East. Div.: D. S. Sutherland, *Supt*. Detroit, Mich.
Bay City, Saginaw & Mackinaw Divisions.:
W. A. Vaughan, *Supt*.........Bay City, Mich.
C. E. Smart, *M. M*..............Bay City, Mich.
Main Line: Gr. Rap.; So. Bend; and So. Hav. Divs.:
C. B. Bush, *Supt*................ Jackson, Mich.
W'n Divs.: R. H. L'Hommedieu, *Supt*. Chicago, Ill.
(2) Lines East of Detroit River:
Wm. H. Perry, *Agt*.............Buffalo, N. Y.
J. E. Morford, *Supt*,........St. Thomas, Ont.
A. Bull, *M. M*...................St. Thomas, Ont.
Rob't Potts, *M. C. B*.........St. Thomas, Ont.
Michigan & Ohio.
Luther Allen, *Supt*.....................Toledo, O.
H. H. Mitchell, *Pur. Agt*...........Toledo, O.
D. J. Durrell, *M. M*........... Marshall, Mich.
Middleburg & Schoharie; and
Schoharie Valley R. Rs. 4-8½ g. 11 m. 2 lo. 6 cars.
P. S. Danforth, *Gen. Supt*... Middleburg, N. Y.
Midland of Canada. (*See Grand Trunk.*)
Midland No. Carolina Ry. 5 g. 95 m. 9 lo. 82 cars.
Atlantic & North Carolina Ry. 22 m.
John D. Whitford, *Gen. Man*..Newbern, N. C.
J. A. Bryan, *Supt*................Newbern, N. C
D. J. Sprague, *Pur. Agt*......New York, N. Y.
B. Manly, *Supt. of Mach*....... Newbern, N. C.
Milton & Sutherlin. (*Oper. by Rich. & Danville.*)
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 370 m. 45 lo. 1,536 cars.
H. G. H. Reed, *Gen. Man. & P. Agt*. Milwaukee, Wis
J. Donahue, *Supt*...............Milwaukee, Wis
David B. Curtis, *Asst. Supt*..... Oshkosh, Wis
John Hickey, *M. M*...............Ledyard, Wis.
Milwaukee & Northern and Wisconsin & Michigan R. Rds. 4-8½ g. 228 m. 24 l. 703 cars.
C. F. Dutton, *Gen. Supt*.......Milwaukee, Wis.
N. S. Kimball, *M. M*...........Ft. Howard, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 43 cars
Chas. E. Holland, *Pr. & Supt*...Hancock, Mich.
W. H. Carr, *Pur. Agt*............Hancock, Mich.
T. J. Shellhorn, *M. M. & C. B*..Hancock, Mich.
Minneapolis, Lyndale & Minnetonka Ry.
3 g. 20 miles 4 motors 1 lo. 35 cars.
William McCrory, *Man*.....Minneapolis, Minn.
T. W. Heintzelman, *M. M*.. Minneapolis, Minn.
Missisquoi R. R. 4-8 g. 28 m.
W. C. Smith, *Man*...............St. Albans, Vt.
Mississippi, Terre Aux Boeufs & Lake R. R.
29 miles.
M. R. Spelman, *Supt*..........New Orleans, La.
Mississippi & Tenn. R. R. 4-8½ g. 101 m. 12 lo. 194 c,
M. Burke, *Gen. Supt*...........Memphis, Tenn.
J. C. Ramsey, *M. M*............Memphis, Tenn.
S. J. Bolton, *M. C. B*............Memphis, Tenn.
Missouri, Kansas & Texas Ry. (*See Mo. Pac.; (2) Div.*)
Missouri Pacific Ry. (Leased and operated lines.)
4-8½ g. 6,029 m. 697 lo. 19,748 cars.
H. M. Hoxie, *3d V. Pres*..........St. Louis, Mo.
R. B. Lyle, *Pur. Agt*..............St. Louis, Mo.
(1), (2) and (3) Divs.:
John Hewitt, *Supt. M. P. & M*...St. Louis, Mo.
John Hodge, *Supt. Car Dep*.......St. Louis, Mo.
Frank Howard, *Asst. Supt. C. D*...Marshall, Tex.
(4), (5) and (6) Divs.:
O. A. Haynes, *S. M. P. & M*.....Marshall, Tex.
(1) Missouri Pacific Ry. 1,028 m. 155 lo. 4,218 cars.
A. M. Hagar, *Supt*..................Sedalia, Mo.
E. Taylor, *M. M*.....................Sedalia, Mo.
W'n Div.: A. M. Hagar, *Supt*........Sedalia, Mo.
(2) Mo., Kan. & Tex. Ry. 1,308 m. 140 lo. 4,248 cars.
S. Irvin, *Asst. Supt. Car Dep*.......Sedalia, Mo.
J. B. Vandyne, *Supt*...............Parsons, Kan.
J. W. Haines, *M. M*..................Parsons, Kan.
(3) Central Branch Un. Pac. R. R. 388 m. 30 lo. 599 c.
W. W. Fagan, *Supt*...............Atchison, Kan.
H. V. Faries, *M. M*.................Atchison, Kan.
J. W. Blackburn, *A. Supt. Car D*..Atchison, Kan.
(4) St. L., I. Mt. & So'n Ry. 905 m. 138 lo. 4,928 c.
Wm. Kerrigan, *Supt*..............St. Louis, Mo.
St. Louis Div.: W. H. Harris, *M. M*. De Soto, Mo.
Ark. Div.: *Supt*.......Little Rock, Ark.
R. M. Richardson, *M. M*.....Little Rock, Ark.
(5) Int. & G. No.: John Herrin, *Supt*..Palestine, Tex.
W. S. Morris, *M. M*............Palestine, Tex.
(6) Tex. & Pac.: W. Cummings, *Supt*. Marshall, Tex.
E. N. O. & Tr. Cont. Divs.:
Geo. Dimick, *Supt*...............Marshall, Tex.
E. A. Haggerty, *M. M*...........Marshall, Tex.
E. R. Smith, *M. M. & M. C. B*..N. Orleans, La.
Rio Grande Div.:
L. L. Keller, *Supt*............Big Springs, Tex.
J. K. Lape, *M. M*............ Big Springs, Tex.
Mobile & Ala. Grand Trunk R. R. 5 g. 59 m. 2 lo. 23 c.
Wm. H. Pratt, *Trustee*...............Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 7 lo. 112 cars
W. L. Clark, *Gen. Supt*..........Columbus, Ga.
J. C. Albrecht, *M. M*.............Columbus, Ga.
A. J. Nix, *M. C. B*..................Columbus, Ga.
Mobile & Montgomery Ry. (*See Louis. & Nash.*)
Mobile & Northwestern R. R. 3 g. 31 m. 2 lo. 16 c.
Thomas T. A. Lyon, *Pres*.......Glendale, Miss.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,353 cars.
G. Jordan, *V.-Pr. & Gen. Man*.....Mobile, Ala.
F. Jordan, *Pur. Agt*..................Mobile, Ala.
M. T. Carson, *Gen. M. M*...........Whistler, Ala.
J. T. Booth, *M. C. B*...............Whistler, Ala.
So'n Div.: J. G. Motley, *Supt*....... Mobile, Ala.
L. J. Morris, *M. M*..................Macon, Miss.
No'n Div.: E. S. Hosford, *Supt*.. Jackson, Tenn.
H. C. Goode, *M. M*...............Jackson, Tenn.
Mobile & Spring Hill R. R. 5-2 g. 8 m. 1 lo. 16 cars.
F. Ingate, *Manager*......................Mobile, Ala.
Moline & Southeastern R. R. 3-6 g. 8 m. 2 lo. 26 c.
R. Battersly, *Gen. Man*.........Coal Valley, Ill.
Mont Alto R. R. 4-9 g. 21 m. 2 lo. 8 cars.
G. B. Wiestling, *Supt. & P. A*....Mont Alto, Pa.
Montgomery & Eufaula Ry. (*See Cen. of Ga.*)
Montgomery Southern Ry. 3 g. 20 m. 1 lo. 15 cars.
S. D. Hubbard, Jr., *Gen. Man*. Montgomery, Ala.
Montour R. R. 4-8½ g. 12 m. 2 lo. 130 cars.
C. R. Brown, *Supt. & Pur. Agt*...Imperial, Pa.
Henry Newman, *M. C. B*.......Imperial, Pa.
Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 86c.
W. A. Stowell, *Supt*............Montpelier, Vt.
Montreal Portland & Boston Ry. (*See Passumpsic.*)
Montreal & Sorel Ry. 4-8½ g. 47 m. 3 lo. 35 c.
C. N. Armstrong, *G. M. & Pur. Agt*. Sorel, Que.
J. F. Armstrong, *Gen. Supt*........Sorel, Que.
G. W. Pangborn, *M. M*..............Sorel, Que.
Montrose Ry. 3 g. 28 m. 3 lo. 24 cars.
T. G. Walter, *Gen. Supt*... Tunkhannock, Pa.
Morgan's Louis. & Tex. R. R. 4-8½ g. 242 m. 46 l. 1,339 c.
J. Kruttschnitt, *Supt*........New Orleans, La.
C. Trumpy, *Pur. Agt*....... New Orleans, La.
J. D. Connell, *M. M*..............Algiers, La.
Jno. Hildebrand, *M. C. B*....... Algiers, La.
Mount Washington R. R. 5-3 g. 3 m. 6 lo. 6 cars.
Walter Aiken, *Gen. Man*........Franklin, N. H.
Muncy Creek Ry. (*See Wmspt. & No. Br.*)

N

Nantasket Beach R. R. 4-8½ g. 6 m. 5 lo. 25 c.
George L. Keyes, *Gen. Supt*......Boston, Mass.
Naugatuck R. R. 3 g. 4 m. 17 lo. 547 cars.
Geo. W. Beach, *Supt*.......Waterbury, Conn.
H. A. Bishop, *Pur. Agt*.....Bridgeport, Conn.
H'y D. Beach, *Supt. R. S*....Bridgeport, Conn.
Napanee, Tamworth & Quebec Ry. In progress.
Ed. W. Rathbun, *Man. Dir*....Deseronto, Ont
R. C. Carter, *Supt*.............Deseronto, Ont.
Narragansett Pier R. R. 4-8½ g. 8 m. 2 lo. 11 c.
G. T. Laupheat, *Supt. & Pur. Agt*. Peacedale, R. I.
Nashua & Rochester R. R. (*See Wor. & Nash.*)
Nashville, Chattanooga & St. Louis Ry.
5 g. 539 miles 87 lo. 1,979 cars.
J. W. Thomas, *G. Man. & P. Agt*. Nashville, Tenn.
M. J. C. Wrenne, *Supt*.........Nashville, Tenn.
James Cullen, *M. M. & C. B*...Nashville, Tenn.
Nashville & Florence R. R. 5 g. 20 m.
J. T. Craik, *Supt*.............Columbia, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 100 m. 7 lo. 92 c.
E. D. Frost, *Gen. Supt*.......... Natchez, Miss.
National Car Company. 4,000 freight cars.
L. Millis, *Pres*......................Boston, Mass.
F. Stewart Stranahan, *Sec. & Tr*. St. Albans, Vt.
John B. Fletcher, *Supt*.......St. Albans, Vt.
Nebraska, Topeka, Iola & Memphis R. R. 4-8½ g. 16 m.
H. M. Clarke, *Gen. Man*..........Girard, Kan.
C. H. Malin, *Gen. Supt*...........Girard, Kan.
Nevada Central R. R. (*See Union Pac.; (7) Div.*)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John F. Kidder, *Supt*........Grass Valley, Cal.
Jas. McCormick, *M. M. & C. B*. Grass Valley, Cal.
Nevada & Oregon R. R. 3 g. 30 m. 25 cars.
D. W. Balch, *Supt*...................Reno, Nev.
New Brunswick Ry. 4-8½ g. 419 m. 20 lo. 357 cars.
E. R. Burpee, *Gen. Man*.....Woodstock, N. B.
Jesse Mathews, *M. M*...............Gibson, N. B.
T. N. Burpee, *M. C. B*....McAdam Junc., N. B.
J. J. Seely, *Pur. Agt*..........Woodstock, N. B.
Thos. Armstrong, *M. M*.... St. Andrew's, N. B.
G. Houlton, *M. C. B*........St. Andrew's, N. B.
New Brunswick & Can. Ry. (*See New Brun.*)
Newburg, Dutchess & Conn. R. R. 4-8½ g. 58 m.
C. L. Kimball, *Supt. & P. Agt*. Matteawan, N. Y.
New Castle R. R. 3-6 g. 5 m. 2 lo. 76 cars.
Geo. Pearson, *Gen. Man*.......New Castle, Pa.
New Castle & Beaver Valley R. R. (*See Penna. Co.*)
New Haven & Derby R. R. 4-8½ g. 13 m. 4 lo. 70 c.
E. S. Quintard, *Supt*..........New Haven, Conn.
J. M. Whitlock, *M. M. & C. B*. New Haven, Conn.
New Haven & No'mpton. 4-8½ g. 170 m. 27 lo. 598 c.
S. B. Opdyke, Jr., *Supt*.......New Haven, Ct.
R. G. Curtis, *Pur. Agt*......... New Haven, Ct.
Henry Fox, *M. M*.............New Haven, Ct.
John Sweeny, *For Car. Shps*...New Haven, Ct.
New Jersey & New York Ry. 4-8½ g. 37 m. 6 lo. 40 c.
J. D. Hasbrouck, *Gen. Man* Jersey City, N. J.
J. S. Drake, *Supt. & M. M*.......Hillsdale, N. J.
L. B. Van Wagonen, *M. C. B*.....Hillsdale, N. J.
N. J. Southern Ry. (*See Phil. & Read.; N. J. So. Div.*)
New London Northern R. R. (*See Central Ver.*)
New Orleans, B. Rouge, Vicks. & Memphis.
Jas. M. Edwards, *Gen. Man*..New Orleans, La.
John Bradley, *Supt*..........New Orleans, La.
New Orleans Pacific Ry. (*See Mo. Pac.; (6) Div.*)
New Orleans & Carrollton R. R.
4-8½ g. 15 m. 12 lo. 79 cars.
C. V. Haile, *Supt*............New Orleans, La.
John Dahmer, *M. M*.........New Orleans, La.
Jas. Thorn, *M. C. B*.........New Orleans, La.
New Orleans & Mobile R. R. (*See Louis. & Nash.*)
N. O. & Northeastern R. R. (*See Cin., N. O. & Tex. Pac.*)
New Orleans & Selma R. R. 5 g. 21 m. 1 lo. 8 cars.
L. B. Schofield, Supt................Selma, Ala.
Newport & Wickford R. R. 4-8½ g. 22 m.
Theo. Warren, *Supt*...............Newport, R. I.
N. Y. Central & Hudson River R. R.
4-8½ g. 983 m. 676 lo. 25,161 cars.
J. M. Toucey, *Gen. Supt*...... New York, N. Y.
Chas. Reed, *Pur. Agt*....... New York, N. Y.
Wm. Buchanan, *Supt. M. P*... New York, N. Y.
L. Garey, *Supt. Car Dept*..... New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, *Supt*. do.
P. McQ. Gibson, *M. M*.......New York, N. Y.
Hud. Riv. Div.: C. M. Bissell, *Supt*. N. York, N. Y.
Peter Smith, *M. C. B*..........New York, N. Y.
E'n Div.: Zenas C. Priest, *Supt*......Utica, N. Y.
John Ortton, *M. M*........West Albany, N. Y.
L. Packard, *M. C. B*.......West Albany, N. Y.
W'n Div.: Geo. H. Burrows, *Supt*. Rochester, N. Y.
S. L. White, *M. M*...............Syracuse, N. Y.
Amos Gould, *M. M*..........E. Buffalo, N. Y.
E. Chamberlain, *M. C. B*... E. Buffalo, N. Y.
C. H. Burchard, *M. C. B*..E. Rochester, N. Y.
Rd. Donaby, *M. C. B*....Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 513 m. 115 lo. 4,838 c.
Lewis Williams, *Gen. Man*........Cleveland, O.
Jno. Mackenzie, *Supt. M. P*. .....Cleveland, O.
Eas'tn Div.: G. H. Kimball, *Supt*...Cleveland, O.
E. A. Miller, *M. M*..................Conneaut, O.
West'n Div.: A. H. Evans, *Supt*......Chicago, Ill.
Jas. Eckford, *M. M*.................Bellevue, O.
New York City & Northern. 4-8½ g. 54 m. 17 lo. 368 c.
Frank S. Gannon, *Gen. Supt*. High Bridge, N. Y.
Tho. Millen, *M. M*........ High Bridge, N. Y.
New York, Lackawanna & W'n Ry. (*See Del. L. & W.*)
New York, Lake Erie & Western R. R.
E. S. Bowen, *V. Pr*..............New York, N. Y.
(1) N. Y., L. E. & W. Div.: 4-8½ g. 1,073 m. 576 lo. 30,553 c.
B. Thomas, *Gen. Supt*........Jersey City, N. J.
J. A. Hardenburgh, *Pur. Agt*. New York, N. Y.
F. M. Wilder, *Supt. M. P. & M*..Susqueh'a, Pa.
E'n Div.: E. O. Hill, *Supt*......Jersey City, N. J.
J. H. Vreeland, *M. M*....... Jersey City, N. J.
J. N. Mileham, *M. C. B*.....Jersey City, N. J.
Del. Div.: W. J. Murphy, *Supt*.. Port Jervis, N. Y.
J. Van Vechten, *M. M. & C. B*. Pt. Jervis, N. Y.
Susq. Div.: J. Jolls, *Supt*..........Elmira, N. Y.
V. Blackburn, *M. M*.........Susquehanna, Pa.
D. B. Goodell, *M. C. B*..........Elmira, N. Y.
Buf. & R. Divs.: Chas. Neilson, *Supt.*; and
G. B. Ross, *M. M*.................Buffalo, N. Y.
M. Wilder, *M. C. B*...............Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, *Supt*. do.
W'n Div.: W. B. Coffin, *Supt*..Hornellsville, N. Y.
Geo. H. Griggs, *M. M*... .Hornellsville, N. Y.
N. Y. & Greenwood L. Ry. 4-8½ g. 44 m. 8 lo. 53 c.
Stephen Smith, *Supt*...........Jersey City, N. J.
F. A. Stinard, *M. M*..............Pompton, N. J.
(2) N. Y., Pa. & O. Div.: 4-8½ g. 565 m. 221 lo. 7,794 c.
J. M. Ferris, *Gen. Supt*.........Cleveland, Ohio.
J. H. Holway, *Pur. Agt*.......Cleveland, Ohio.
Wm. Fuller, *Gen. M. M. & C. B*...Cleveland, O.
S. V. Smith, *Asst. Gen. M. C. B*. ...Kent, Ohio.
E'n Div.: A. L. Dunbar, *Supt*.......Meadville, Pa.
J. A. Cooper, *M. M*..............Meadville, Pa.
D. S. Dockstader, *M. C. Rep*...Meadville, Pa.
W'n Div.: T. A. Phillips, *Supt*........... Galion, O.
Wm. Hill, *M. M*......................Galion, O.
J. W. Holmes, *For. Car Rep*.......Galion, O.
Geo. Wilson, *For. Car Rep*.... Dayton, Ohio.
Maho'g Div.: N. F. Wood, *Supt*......Cleveland, O.
N. Wright, *M. M*.................Cleveland, O.
C. N. Thorp, *M. C. Rep*........Cleveland, O.
New York, New Haven & Hartford R. R.
4-8½ g. 203 m. 123 lo. 2,768 cars.
E. M. Reed, *V. P. & Gen. Man*..New Haven, Ct.
R. N. Dowd, *Pur. Agt*..........New Haven, Ct.
N. Y. & N. H. Div.: W. H. Stevenson, *Supt*...N. Y.
Shore Line and Air Line Divs.:
O. M. Shepard, *Supt*.......... N. Haven, Ct.
John Henny, Jr., *Supt. M. P*..New Haven, Ct.
Jas. Denver, *M. C. B*............New Haven, Ct.
Hart. Div.: C. S. Davidson, *Supt*....Hartford, Ct.
Supt. M. P. & M. C. B.... do.
N. Y., Ontario & Western Ry. (*See N. Y., W. Sh. & Buf.*)
N. Y., Pittsb'h & Chicago. 4-8½ g. 20 m. 2 lo. 32 c.
Geo. W. Dixon, *Supt*..........New Galilee, Pa.
H. T. Hanna, *Pur. Agt*..........Pittsburgh, Pa.
N. Y., Pennsylvania & Ohio R. R. (*See N. Y., L. E. & W.*)
New York, Philadelphia & Norfolk R. R.
4-8½ g. 10 m. 1 lo. 4 cars.
Jas. McConkey, *Supt*........Princess Ann, Md.
New York, Providence & Boston R. R.
4-8½ g. 83 m. 29 lo. 430 cars.
J. B. Gardner, *Supt*.............Providence, R. I.
Giles F. Ward, *Pur. Agt*......Stonington, Conn.
J. H. Anderson, *M. M. & C. B*. Providence, R. I.
N. Y., Susqueh'na & W'n. 4-9 g. 147 m. 33 lo. 1,469 c.
F. A. Potts, *Gen. Man*.........New York, N. Y.
C. D. McKelvey, *Asst. Supt*. Jersey City, N. J.
C. T. Demarest, *Pur. Agt*.....New York, N. Y.
W. C. Ennis, *M. M. & C. B*...Wortendyke, N. J.
New York, Texas & Mexican Ry.
4-8½ g. 92 m. 6 lo. 95 cars.
Allen McCoy, *Gen. Man*........Victoria, Tex.
J. G. Conlon, *M. M*................Victoria, Tex.
New York, West Shore & Buffalo.
4-8½ g. 850 m. 98 lo. 2,907 c.
J. D. Layng, *Gen. Man*.......New York, N. Y.
C. D. Gorham, *Gen. Supt*......Weehawken, N. J.
P. S. Bemis, *Pur. Agt*.........New York, N. Y.
R. H. Soule, *Supt. M. P*.........Frankfort, N. Y.
H. R. Div.: C. W. Bradley, *Supt*., Weehawken, N. J.
Harry Linn, *M. M*..........New Durham, N. J.
Moh'k Div.: H. W. Gardiner, *Supt*. Syracuse, N. Y.
Buff. Div.: D. B. McCoy, *Supt*.....Buffalo, N. Y.
New York, Ontario & Western.
J. E. Childs, *Gen. Supt*.........New York, N. Y.
N. Y. Woodhaven & Rockaway R. R. (*See Long Is.*)
N. Y. & Greenwood Lake Ry. (*See N. Y., L. E. & W.*)
N. Y. & Manhattan Beach Ry. (*See Long Island.*)
New York & Long Branch R. R. (*See Phil. & Read.*)
New York & New England R. R.
4-8½ g. 473 m. 145 lo. 3,959 cars.
W. H. Turner, *Gen. Supt*........Boston, Mass.
W. W. McKim, *Pur. Agt*.........Boston, Mass.
J. B. Henney, *Supt. M. P*........ Boston, Mass.
Geo. E. Boyden, *M. M*........Norwood, Mass.
Elias E. Pratt, *M. C. B*..........Norwood, Mass.
East Div: E. G. Allen, *Supt*........Boston, Mass.
Nor. Div.: P. St. M. Andrews, *Supt*...Norwich, Ct.
, *M. M*.............Norwich, Ct.
Prov. Div.: L. W. Palmer, *Supt*..Providence, R. I.
Hfd. Div.: E. Holbrook, *Supt*.......Hartford, Ct.
E. M. Humstone, *M. M*..........Hartford, Ct.
West'n Div.: C. H. Platt, *Supt*.....Fishkill, N. Y.
Woons'kt Div.:
E. N. Tucker, *Supt*..........Needham, Mass.
New York & Sea Beach R. R. 4-8½ g. 6 m. 4 lo. 40 c.
C. W. Douglass, *Supt*..........Bay Ridge, N. Y.
, *Supt*.........Bay Ridge, N. Y.
Newark, Somerset & Straitsville R. R. (*See B. & O.*)
Newburg, Dutchess & Conn. R. R. 4-8½ g. 59 miles.
C. L. Kimball, *Gen. Supt*.....Matteawan, N. Y.
W. G. Van Buskirk, *M. M. & C. B.*,
Dutchess Junction, N. Y
Newfoundland Ry. 3-6 g. 45 m. 7 lo. 41 c.
C. X. Hobbs, *Gen. Man*........St. John's, N'f'd.
Norfolk Southern R. R. 4-8½ g. 74 m. 7 lo. 182 c.
M. K. King, *Gen. Man. & Pur. Agt*. Norfolk, Va.
J. S. Whitworth, *M. M. & C. B*....Norfolk, Va.
Norfolk & Ocean View Narrow Gauge R. R.
3 g. 8 m. 2 lo. 9 cars.
W. H. Taylor, *Pres*...................Norfolk, Va.
Norfolk & Va. Beach R. R. 3 g. 18 m.
J. M. Dickey, *Gen. Man*..........Norfolk, Va.
Norfolk & Western R. R. (*See Shenandoah Val.*)
North-Eastern R. R. of Ga. 5 g. 72 m. 2 lo. 20 cars.
H. R. Bernard, *Supt*................Athens, Ga.
North-Eastern R. R. (S. C.) (*See Wil. & Wel.*
North Pacific Coast R. R. 3 g. 84 m. 12 lo. 320 cars.
David Nye, *Gen. Supt*..........San Rafael, Cal.
W. F. Russell, *Pur. Agt*....San Francisco, Cal.
E. L. Reese, *M. M*.................Saucelito, Cal.
North Shore Ry. 4-8½ g. 209 m. 21 lo. 564 c.
W. Wainwright, *Gen. Man*......Montreal, Can.
A. Davis, *Supt. & Pur. Agt*.......Quebec, Can
Northern (N. H.), and Concord & Claremont Rys.
4-8½ g. 173 m. 25 lo. 569 cars.
Geo. E. Todd, *Supt*...............Concord, N. H.
M. M. & C. B. & Pur. Agt.. do.
Northern (N. J.) R. R. (*See N. Y., L. E. & W'n.*)
Northern Central Ry. (*See Penna. R. R. (6) Div.*)
North'n Pacific R. R. 4-8½ g. 2,207 m. 391 lo. 9,897 c.
T. F. Oakes, *Gen. Man*..........St. Paul, Minn.
John H. Ames, *Gen. Pur. Agt*..St. Paul, Minn.
Geo. W. Cushing, *Supt. M. P., M. & R. S*. do.
J. C. Barber, *M. C. B*...........Brainerd, Minn.
(1) E'n Div.: J. T. Odell, *A. Gen. Man*. St. Paul, Minn.
H. J. Small, *A. S. Mach*.......Brainerd, Minn.
1st Gr. Div.: M. C. Kimberly, *Supt*. Brainerd, Minn.
M. C. B......Brainerd, Minn.
2d Gr. Div.: J. M. Graham, *Supt*. Jamestown, Dak.
C. C. Quinn, *M. M*.................Fargo, Dak.
A. Bardsley, *M. M*..............Mandan, Dak.
F. Greene, *A. Supt*............Mandan, Dak.
3d Gr. Div.: S. R. Ainslie, *Supt*.. Glendive, Mont.
S. L. Bean, *M. M*..............Glendive, Mont.
J. C. Munro, *M. M*.........Livingston, Mont.
(2) W'n Div.: J. M. Buckley, *Asst. Gen. Man*.
New Tacoma, W. T.
H. D. Sanborn, *P. Agt*........Portland, Ore.
W. T. Small, *A. S. Mach*.......Portland, Ore.
4th Gr. Div.: J. B. Cable, *Supt*...Missoula, Mont.
Jas. Walsh, *M. M*..............Missoula, Mont.
J. Evans, *M. M*...............Sprague, W. T.
5th Gr. Div.: Otis Sprague, *Supt*...Tacoma, W. T.
H. H. Warner, *M. M*............Tacoma, W. T.
Northern & North-W'n Rys. 4-8½ g. 378 m. 50 lo. 1,195 c.
James Webster, *Supt*...........Toronto, Can.
W. C. Schreeber, *Pur. Agt*........Toronto, Can.
P. Clarke, *M. M*.....................Toronto, Can.
Nova Scotia Ry. 4-8½ g. 79 m. 9 lo. 268 c.
C. A. Scott, *Gen. Man*......New Glasgow, N. S.
M. F. Punch, *M. M*........New Glasgow, N. S.

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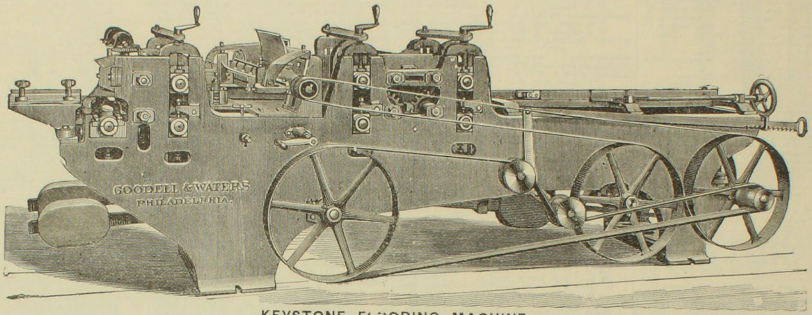
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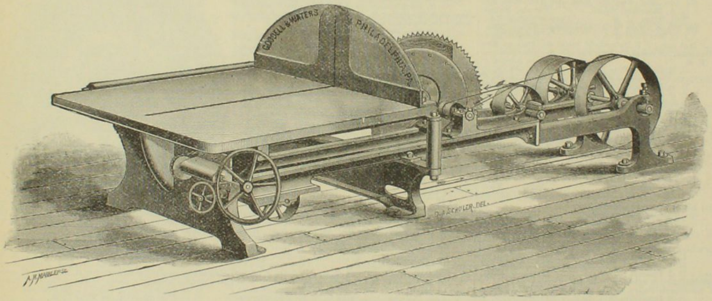
KEYSTONE FLOORING MACHINE.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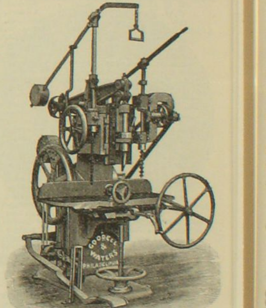
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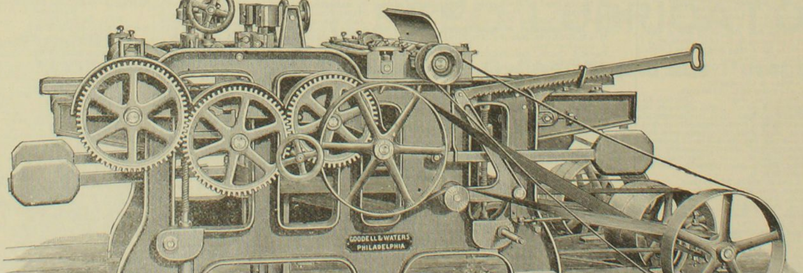
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O

Ogdensburg & Lake Champlain R. R.
4-8½ g. 122 m. 33 lo. 1,694 cars.
A. A. Gaddis, *Gen. Man*......Ogdensburg, N. Y.
E. B. Burnham, *Pur. Agt*...Ogdensburg, N. Y.
Abr. Klohs, *Supt. & M. M*........Malone, N. Y.
J. N. Brown, *Master Builder*.Ogdensburg, N. Y.
Ohio Central R. R. 4-8½ g. 325 m. 46 lo. 4,760 cars.
John E. Martin, *Rec*...... Toledo, O.
T. M. Peelar, *Supt* .... Bucyrus, O.
F. W. Stewart, *Pur. Agt* .. ..Toledo, O.
J. B. Morgan, *M. M. & C. B*... ....Bucyrus, O.
Ohio River R. R. 4-9 g. (in progress).
Chas. Howard, *Gen. Supt*.Parkersburg, W. Va.
Ohio Southern R. R. (*See Ind., Bloom. & W'n.*)
Ohio & Mississippi Ry. 4-9 g. 616 m. 113 lo. 2,501 cars.
W. W. Peabody, *Pres. & Gen. Man*.Cincinnati, O.
G. E. Atwood, *Pur. Agt*..........Cincinnati, O.
J. H. Setchel, *Gen. M. M*..........Cincinnati, O.
Cin. Div.: C. B. Cole, *Supt*..... ....Seymour, Ind.
E. E. Jenks, *A. Gen. For*......Seymour, Ind.
J. P. Coulter, *M. C. B*.. ....Aurora, Ind.
Arthur Donaldson, *M. M*......Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, *Supt*.St. Louis, Mo.
J. W. Stokes, *M. M.* (Spring. Div.)..Pana, Ill.
Louisv. Div.: C. B. Cole, *Supt* . .Louisville, Ky
Oil City & Chicago R. R. (*See Buff., N. Y. & Phil.*)
Old Colony R. R. 4-8½ g. 470 m. 124 lo. 3,327 cars.
J. R. Kendrick, *Gen. Man*... ....Boston, Mass.
R. W. Husted, *Pur. Agt*..........Boston, Mass.
Jas. N. Lauder, *Supt. R. S*...... Boston, Mass.
Sam. Stevens, *S. Br. & Bld'gs*....Boston, Mass.
Main Li. Div.: J. H. French, *Supt*...Boston, Mass.
, *M. M*...... ..Boston, Mass.
Cape Cod Div.: C. H. Nye, *Supt*..Hyannis, Mass.
C. Berkley Powell, *M. M*..........Boston, Mass.
No. Div.: S. A. Webber, *Supt*....Fitchburg, Mass.
F. M. Twombly, *M. M*.... .... Taunton, Mass
Olympia & Chehalis Val. R. R. 3 g. 15 m.
Otis Sprague, *Supt* ....Olympia, W. T.
Oregon Ry. & Navigation Co.
3 & 4-8½ g. 577 m. 72 lo. 1,611 cars.
C. H. Prescott, *V. P. & Gen. Man*.Portland, Ore.
F. T. Dodge, *Supt*. (Riv. Div.)....Portland, Ore.
H. S. Rowe, *Supt*. (Ry Div.)......Portland, Ore.
J. M. Drake, *Pur. Agt*........... Portland, Ore.
Goodall, Perkins & Co., *Supt*. (Ocean Div.)
San Francisco, Cal.
C. C. Hobart, *Gen. M. M*.......The Dalles, Ore
Chas. A. Phipps, *M. C. B*..... The Dalles, Ore.
Oregon & California R. R. 4-8½ g. 449 m. 43 lo. 626 c.
R. Koehler, *Gen. Man*............Portland, Ore
J. Brandt, *Gen. Supt*.............Portland, Ore.
W. T. Bodley, *Pur. Agt*..........Portland, Ore.
A. Brandt, *M. M*.. ....Portland, Ore.
Ottumwa & Kirkville Ry. 4-8½ g. 13 m.
J. A. Kebler, *Supt*. ....Ottumwa, Ia.
Owensboro & Nashville R. R. 5 g. 44 m. 3 lo. 70 c.
M. Newbold, *Supt*.... ....Owensboro, Ky.
H. M. Gabel, *M. M. & C. B*....Owensboro, Ky.
Oxford & Henderson R. R. 4-8½ g. 13 m. 2 lo. 11 c.
James A. White, *Gen. Supt*...Henderson, N. C.
James E. Lawrence, *M. M*....Henderson, N. C.

P

Pacific Coast Ry. 3 g. 64 m.
J. M. Fillmore, *Manager*.San Luis Obispo, Cal.
W. H. Masterman, *M. M. & C. B*. do.
Painesville & Youngstown Ry. 3 g. 65 m. 7 lo. 319 c.
R. K. Paige, *Rec. & Man*.........Painesville, O.
J. A. Newcome, *Supt. R. S*..... ..Painesville, O.
Panama R. R. 5 g. 48 m. 14 lo. 2,200 cars.
G. A. Burt, *Gen. Supt*..... Aspinwall, U. S. Col.
E. Z. Penfield, *Pur. Agt*.......New York, N. Y.
Jas. Reilly, *M. M*...........Aspinwall, U. S. Col
Passumpsic R. R. 4-8½ g. 147 m. 28 lo. 1,101 cars.
E. Raymond, *Pres. & Pur. Agt*. Boston, Mass.
H. E. Folsom, *Supt*............Lyndonville, Vt.
L. L. Brigham, *M. M*........ . Lyndonville, Vt.
L. F. Woodard, *M. C. B* ....Lyndonville, Vt.
Paulding & Cecil Railway. 4-8½ g. 7 m. 3 lo. 28 c.
S. Frank Eagle, *Pres*....... ....Cecil, O.
Paw Paw and Toledo & South Haven R. Rds.
3 g. 20 m. 3 lo. 16 cars.
John Ihling, *Supt*...... ....Lawton, Mich.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
B. B. Newton, *Supt. & Pur. Agt*...Oxford, Pa.
E. H. Williams, *M. C. B*...............York, Pa.
W. P. Kirk, *M. M*.................Oxford, Pa.
Pemigewasset Valley R. R. 4-8½ g. 21 m. 2 lo. 127c.
J. Thomas Vose, *Pres*........ ...Boston, Mass.
Pennsylvania Co.'s (5) Roads.
4-9 g. 3,222 m. 920 lo. 32,809 cars.
Gen. Divs. (1), (2), (3), (4) and (5).
Wm. A. Baldwin, *Gen. Man*.....Pittsburg, Pa.
John Thomas, *Gen. Supt*..... Pittsburg, Pa.
Wm. Mullins, *Gen. Pur. Agt*......Pittsburg, Pa.
Joseph Wood, *Supt. M. P*.... .Fort Wayne, Ind.
(1) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 288 lo. 8,023 cars.
E'n Div.: A. B. Starr, *Supt*.......Allegheny, Pa.
Geo. J. Parkin, *M. M*..... ....Allegheny, Pa.
D. M. Peppard, *M. M*........ . Crestline, O.
W'n Div.: C. D. Law, *Supt*.....Ft. Wayne, Ind.
F. D. Casanave, *M. M*........Ft. Wayne, Ind.
A. H. Somers, *Gen. For. Shops*...Chicago, Ill.
(2) Ashtabula & Pittsburg, and
(3) Erie & Pittsburg R. Rds. 221 m. 29 lo. 1,362 c.
John M. Kimball, *Supt*..Lawrence Junc., Pa.
J. A. Wood, *Gen. For. Shops*........Erie, Pa.
(4) Cleveland & Pittsb'g R. R. 225 m. 97 lo. 3,534 c.
R. F. Smith, *Asst. Man*.........Cleveland, O.
Philip Bruner, *Supt*.............Wellsville, O.
W. F. Beardsley, *Mast. of Mach*.Wellsville, O.
(5) No-W'n Ohio Ry.: J. S. Morris, *Supt*...Toledo, O.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 3,158 m. 1,459 loco. 66,816 cars.
Chas. E. Pugh, *Gen Man*......Philadelphia, Pa.
Enoch Lewis, *Pur. Agt*.......Philadelphia, Pa.
John Reilly, *Supt. Trans*......Philadelphia, Pa.
T. N. Ely, *Gen S. M. P*.............Altoona, Pa.
Pennsylvania R. R. Divs.
4-9 g. 1,213 m. 705 lo. 46,819cars.
S. M. Prevost, *Gen Supt*. ... .Altoona, Pa
Frank L. Sheppard, *Supt. M. P*..Altoona, Pa.
G. W. Strattan, *M. M*.. ....Altoona, Pa.
Jno. P. Levan, *Gen. Fore*... ....Altoona, Pa.
Phila. Div.: Tho. Gucker, *Supt*.Philadelphia, Pa.
H. D. Garrett, *M. M*....W. Philadelphia, Pa.
I. W. Van Houten, *Gen. For*....W. Phila., Pa.
Mid. Div.: O. E. McClellan, *Supt*.Harrisburg, Pa.
E. L. Caum, *M. M*.............Harrisburg, Pa.
Samuel W. Myers, *Gen. For*.Harrisburg, Pa.
Altoona Div.: Jas. Reed, *Supt*.......Altoona, Pa.
Pitts. Div.: Robert Pitcairn, *Supt*....Pittsburg, Pa.
D. O. Shaver, *M. M*..............Pittsburg, Pa.
J. G. Stewart, *Gen. For*........Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, *Supt*.Blairsville, Pa.
Wm. B. Norris, *M. M*..........Blairsville, Pa.
M. H. Falls, *Gen. For*...........Blairsville, Pa
Fred. Div.: J. B. Hutchinson, *Supt*.....York, Pa
Tyrone Div.: S. S. Blair, *Supt*.......Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, *Supt*.Lewistown, Pa.
Bed. Div.: R. L. Holliday, *Supt*......Bedford, Pa.
Monong. Div.: David M. Watt, *Supt*.Pittsburg, Pa.
Wm. Lininger, *M. M*............Pittsburg, Pa
(2) United R. Rs. of N. J. Divs. 471 m. 330 lo. 4,041 c.
F. Wolcott Jackson, *Gen. St*..Jersey City, N. J.
H. S. Hayward, *Supt. M. P*...Jersey City, N. J.
David H. Baker, *Gen. For*...Jersey City, N. J.
N. Y. Div.: Robt. E. Pettit, *Supt*.Jersey City, N. J.
L. A. Bosdevex, *M. M*. ..Jersey City, N. J.
E. F. Bosdevex, *Gen. For*..Jersey City, N. J.
Belv. Div.: J. A. Anderson, *Supt*.Lambertv., N. J.
R. McDowell, *M. M*.......Lambertville, N. J.
Amboy Div.: I. S. Buckalew, *Supt*.Camden, N. J.
Thos. Kerr, *M. M*....... ....So. Amboy, N. J.
P. S. Bogart, *Gen. For*......So. Amboy, N. J.
(2½) Camden & At. Rd.: 75 m. 18 l. 261 c.
W. N. Bannard, *Supt*................and
Rufus Hill, *M. M*.. ....Camden, N. J.
Samuel Wills, *M. C. B*...... ..Camden, N. J.
(3) West Jersey R. R. 4-9 g. 188 m. 27 lo. 294 cars.
Joseph Crawford, *Gen. Supt*.....Camden, N. J.
W. McAlister, *M. M*.... ....Camden, N. J.
C. C. Williams, *Gen. For*........Camden, N. J.
(4) Phila., Wilm. & Balt. R. R. 409 m. 128 lo. 1,882 c.
H. F. Kenney, *Gen. Supt*. ....Philadelphia, Pa.
J. M. Wallis, *S. M. P*........Philadelphia, Pa.
H. D. Gordon, *M. M*.........Wilmington, Del.
W. H. Lungren, *M. C. B*.... ..Wilmington, Del.
Cen. Div.: L. K. Lodge, *Supt*......... Media, Pa.
Del. Div.: I. N. Mills, *Supt*......Wilmington, Del.
Mo. Div.: H. H. Carter, *Supt*..Wilmington, Del.
(5) Phila. & Erie R. R. Divs.: 437 m. 110 lo. 3,089 c.
R. Neilson, *Gen. Supt*.... ...Williamsport, Pa.
A. O. Dayton, *Supt. Mo. Po*..Williamsport, Pa.
E'n. Div.: E. B. Westfall, *Supt*.Williamsport, Pa.
Sun. H. & W. Div: A. Walter, *Supt.;* and
H. K. Stout, *M. M*.... ... .Sunbury, Pa.
Mid. Div.: Tho. A. Roberts, *Supt*.....Renovo, Pa.
Wm. L. Holman, *M. M*..........Renovo, Pa.
West'n Div.: J. W. Reynolds, *Supt*.....Erie, Pa.
W. T. Smith, *M. M*................. ..Erie, Pa.
(6) Northern Central Ry. 4-9 g. 346 m. 152 lo. 6,610 c.
Robert Neilson, *Gen. Supt*...Williamsport, Pa.
A. O. Dayton, *Supt. M. P*....Williamsport, Pa.
A. W. Sumner, *Pur. Agt*... ....Baltimore, Md.
J. M. Coale, *M. M*................Baltimore, Md.
G. W. Demarest, *Gen. For*......Baltimore, Md.
Susq. Div.: E. B. Westfall, *Supt*.Williamsport, Pa.
Sham. Div.: A. Walter, *Supt*..... ..Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, *Supt*..Elmira, N. Y.
Jas. Strode, *M. M*.... ....Elmira, N. Y.
J. C. Dyott, *Gen. For*.... ......Elmira, N. Y.
Baltimore Div.: H. W. Kapp, *Supt*.Baltimore, Md.
(7) Balt. & Pot. & Alex. & Fred. 125 m. 30 lo. 360 c.
H. F. Kenny, *Gen. Supt*......Philadelphia, Pa.
A. W. Sumner, *Pur. Agt*.. .....Baltimore, Md.
J. M. Wallis, *Supt. Mo. Po*....Philadelphia, Pa.
H. D. Gordon, *M. M*.........Wilmington, Del.
J. Lescallett, *For. Mach. Shop*.Washington, D. C.
R. F. Downs, *For. Car Shop*..Washington, D. C.
Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 3,271 c.
J. B. Smith, *Gen. Supt*. ..... .Dunmore, Pa
And. Crane, *M. M*. ....Dunmore, Pa.
Geo. W. Simpson, *M. C. B*........Dunmore, Pa.
Pennsylvania, Slatington & New England R. R.
In progress. 4-8½ g. 18 m. 1 lo. 20 cars.
C. H. Stanton, *Supt*........... New York, N. Y.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, *Gen. Supt*...........Ridgeway, Pa.
Pensacola & Atlantic R. R. 5 g. 161 m. 9 lo. 67 cars.
W. D. Chipley, *Gen. Supt*.......Pensacola, Fla.
W. D. Robb, *M. M*............ .Pensacola, Fla.
Pensacola & Perdido R. R. 5 g. 10 m. 5 lo. 92 cars.
B. F. Simmons, *Pr. & Supt*.... Pensacola, Fla.
H. W. Simmons, *Pur. Agt*......Pensacola, Fla.
J. C. Schutte, *M. M*.............Pensacola, Fla.
People's Ry. 4-8½ g. 15 m. 2 lo. 14 cars.
W. D. Pollard, *Supt*....... ......Pottsville, Pa.
Peoria, Decatur & Evansville Ry.
4-8½ g. 254 m. 30 lo. 1,660 cars.
G. L. Bradbury, *Gen. Man*.... .... Peoria, Ill.
P. Reilly, *M. M*....................Mattoon, Ill.
Peoria & Farmington R. R. (*See Cen. Ia.*)
Peoria & Pekin Union Ry. 4-8½ g. 20 m. 12 lo. 106 c.
Thos. B. Burnett, *Gen. Supt. & P. A*.Peoria, Ill.
O. W. Bell, *Supt* ....Peoria, Ill.
R. F. Hurd, *M. M. & C. B*.. ....Peoria, Ill.
Perkiomen R. R. 4-8½ gauge 39 miles.
D. B. Clack, *Supt*......Perkiomen Junction, Pa.
H. Boyd, *Pur. Agt*..............Norristown, Pa.
Petersburg R. R. 4-8½ g. 64 m. 10 lo. 133 cars.
R. M. Sully, *Gen. Supt*....... .Petersburg, Va.
Geo. F. Jones, *Pur. Agt*.... ...Petersburg, Va.
, *M. M*..... .....Petersburg, Va.
J. W. Fleming, *M. C. B*........Petersburg, Va.
Phila., Wilmington & Balt. R. R. (*See Penna. R. R.*)
Peterborough & Hillsborough. (*See Northern, N. H.*)
Philadelphia, Newtown & N. Y. R. R. 4-8½ g. 23 m.
W. M. Geary, *Supt*...........Philadelphia, Pa.
Phila. & Atlantic City Ry. 3-6 g. 55 m. 11 lo. 134 cars.
F. S. Urie, *Supt*............. .Philadelphia, Pa.
W. S. Wilson, *Pur. Agt*.......Philadelphia, Pa.
H. M. Messimer, *M. M* ....Camden, N. J.
E. Lippincott, *M. C. B*.... ......Camden, N. J.
Philadelphia & Erie R. R. (*See Penna. R. R.; (5) Div.*)
Philadelphia & Reading R. R. (and Branches.)
4-8½ g. 1,582 m. 907 lo. 56,775 cars.
John E. Wootten, *Gen. Man*..Philadelphia, Pa.
W. S. Wilson, *Pur. Agt*......Philadelphia, Pa.
Geo. Eltz, *Supt. Trans*.. .... Reading, Pa.
L. B. Paxson, *Eng. of Mach*...... Reading, Pa.
No. Pa. & Bound Brook Div.:
I. A. Sweigard, *Supt*........Philadelphia, Pa.
Mahanoy & Shamokin and other Brs.:
J. H. Olhausen, *Supt*..........Pottsville, Pa.
D. C. Reinhart, *Asst. Supt*. ...Catawissa, Pa.
A. A. Hesser, *Asst. Supt* Mahanoy Plane, Pa.
Schuylkill & Susquehanna Br.:
H. H. Tracy, *Supt* ....Pine Grove, Pa.
Reading & Columbia Br.:
A. M. Wilson, *Supt* ....Columbia, Pa.
(2) N. J. Central Div.:
W. W. Stearns, *Supt*..... .....Elizabeth, N. J.
W. Woodcock, *M. M*.. ......Elizabethport, N. J.
Geo. Hackett, *M. C. B*. ....Elizabethport, N. J.
C. G. Williams, *M. M*.........Jersey City, N. J.
John Alpaugh, *M. M*.........Phillipsburg, N. J.
L. Br. Div.: R. Blodgett, *Supt*...Long Branch, N. J.
N. J. So. Div.: W. W. Stearns, *Supt*. Elizabeth, N. J.
Wm. Montgomery, *M. M*....Manchester, N. J.
Chas. N. Sawyer, *M. C. B*....Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, *Supt*. .. Mauch Chunk, Pa.
Pittsburgh, Bradford & Buffalo Ry. (*See Pitts. & West.*)
Pittsburgh, Chartiers & Youghiogheny R. R.
4-8¾ g. 19 m.
Geo. S. Griscom, *Gen. Man*.....Pittsburgh, Pa.
Pittsburgh, Cincinnati & St. Louis Ry. (5 Gen. Divs.)
4-9 g. 916 m. 239 lo. 7,133 cars.
James McCrea, *Manager*.........Columbus, O.
Wm. Mullins, *Pur. Agt*.... ...Pittsburgh, Pa.
Edward B. Wall, *Supt M. P*.......Columbus, O.
(1) P., C. & St. L. Div.: E. B. Taylor, *Supt*.Pittsburgh, Pa.
C. B. Street, *M. M*.. ....Dennison, O.
J. M. Copeland, *G. F. Car Shops*.Steubenville, O.
(2) C. & M. V. Div.: W. F. Black *Supt*..Zanesville, O.
Leroy Kells, *M. M*.. . ...Lancaster, O.
Wm. Meikle, *Gen. For*......... Lancaster, O.
Daniel Jewell, *Gen. F. Car Shops*.Lancaster, O.
(3) Li. Mi. Div.: Ralph Peters, *Supt*....Cincinnati, O.
Leroy Kells, *M. M*...............Cincinnati, O.
Jos. Underwood, *G. F. Car Shops*.Cincinnati, O.
(4) J. M. & I. R. R.: E. W. McKenna, *Supt*.Louisville, Ky.
Wm. Swanston, *M. M*. ...Jeffersonville, Ind.
Edw. Austin, *G. F. C. Shops*.Jeffersonville, Ind.
(5) Indianapolis & Vincennes R. R.
J. J. Turner, *Supt*........Indianapolis, Ind.
Pittsburgh, Cleveland & Toledo R. R.
4-8¾ g. 78 m. 18 lo. 525 cars.
C. H. Andrews, *Pres*............Youngstown, O.
W. F. Hofecker, *M. M*... ...Youngstown, O.
Pittsburgh, Ft. Wayne & Chicago Ry. (*See Penna. Co.*)
Pittsburgh Southern Ry. (*See Balt. & O.*)
Pitts. & Castle Shannon R. R. 3-4 g. 9 m. 5 lo. 428 c.
James M. Bailey, *Gen. Supt*... Pittsburgh, Pa.
Holmes Ward, *M. M*.......Castle Shannon, Pa.
Wm. E. Long, *M. C. B* .... Pittsburgh, Pa.
Pitts. & Lake Erie R. R. 4-8¾ g. 70 m. 31 lo. 1,820 c.
W. C. Quincy, *Gen. Man*.........Pittsburgh, Pa.
D. H. Hostetter *Pur. Agt*..... Pittsburgh, Pa.
R. W. Jones, *Mast. Trans*.......Pittsburgh, Pa.
S. W. Haines, *M. M*........ ....Pittsburgh, Pa.
Pittsburgh, McKeesport & Youghiogheny.
4-8¾ g. 57 m. 19 lo. 267 cars.
W. C. Quincy, *Gen. Man*...... Pittsburgh, Pa.
R. W. Jones, *M. of Trans*......Pittsburgh, Pa.
S. W. Haines, *M. M*........... Pittsburgh, Pa.
Pitts. & Western R. R. 3 & 4-8½ g. 110 m. 18 lo. 365 c.
Pitts., Bradford & Buff. Ry. 3 g. 93 m. 8 lo. 163 c.
Tho. M. King, *Gen. Man*.........Allegheny, Pa.
J. T. Johnson, *Supt*.... ....Allegheny, Pa.
J. Morton Hall, *Pur. Agt*..... ..Allegheny, Pa.
W. M. Flahavhan, *M. M*.........Allegheny, Pa
Pontiac, Oxford & Pt. Austin R. R. 100 m.
Geo. W. Debevoise, *Pr. & Gen. Man*.Oxford, Mich.
Jas. Houston, *Gen. Supt*....... ..Oxford, Mich.
Port Huron & No.-Western Ry. 3 g. 218 m. 14 lo. 288 c.
H. McMorran, *G. Man. & P. A*.Port Huron, Mich.
J. R. Wadsworth, *Supt*.. ...Port Huron, Mich.
Chas. Deifenbach, *M. M*.....Port Huron, Mich.
Benj. Hillier, *M. C. B*........Port Huron, Mich.
Port Jervis & Monticello R. R. 4-8½ g. 24 m. 3 lo. 13 c.
M. V. Heller, *Gen. Man*......Port Jervis, N. Y.
Port Royal & Augusta Ry. 5 g. 180 m. 16 lo. 310c.
J. N. Bass, *Supt*..... ....Augusta, Ga.
T. F. Warwick, *M. M. & M. C. B*.Augusta, Ga.
Portland & Ogdensburg. 4-8½ g. 110 m. 11 lo. 311 c.
J. Hamilton, *Gen. Supt. & P. A*..Portland, Me.
M. M........ ....Portland, Me.
W. G. Brewer, *M. C. B*.... .. .Portland, Me.
Portland & Rochester R. R. 4-8½ g. 52 m. 7 lo. 230 c.
J. W. Peters, *Supt. & Pur Agt*...Portland, Me.
E. H. C. Tompson, *For. of Mach*..Portland, Me.
David Dow, *For. of Car Repairs*.Portland, Me
Potomac, Fred.'g & Pied. R. R 3 g. 38 m. 2 lo. 38 c.
Will M. Grafton, *Supt*.... ..Fredericksburg, Va.
W. J. Sweigard, *M. M* ....Fredericksburg, Va.
Pough., Hart. & Bos. R. R. 4-8½ g. 45 m. 4 lo. 65 c.
J. A. Perkins, *Supt*........Poughkeepsie, N. Y.
John L. Donaldson, *M. M*.Poughkeepsie, N. Y.
Pratt Coal & Coke Company's R. R. 5 g. 9 m. 5 lo. 100 c.
W. L. Gude, *Gen. Man*.... ...Pratt Mines, Ala.
Prescott & Thirty-Fifth Parallel R. R.
4-8½ g. 77 miles in progress.
Samuel A. Henszey, *Gen. Man*. Prescott, Ariz.
Prince Edward Island Ry. 3-6 g. 199 m. 18 lo. 280 c.
Jas. Coleman, *Supt. & Pur. Agt.;*
Jos. Unsworth, *M. Supt. & Storekeeper;* and
D. M. Fraser, *M. C. B*.. .Charlottetown, P. E. I.
Profile & Franconia Notch R. R. 3 g. 15 m. 3 lo. 18 c.
Emmons Raymond, *Pur. Agt*.. Boston, Mass.
C. H. Greenleaf, *Supt*......Profile House, N. H.
Prospect Park & Coney Island R. R.
4-8½ g. 15 m. 8 lo. 123 cars.
R. Schermerhorn, *Supt*........Brooklyn, N. Y.
Martin Painter, *M. M*..........Brooklyn, N. Y.
Prov., Warren & Bristol R. R. 4-8½ g. 19 m. 6 lo. 79 c.
Waterman Stone, *Supt*.. .. ..Providence, R. I.
Rufus Smith, *M. M. & C. B*....... ..Bristol, R. I.
Prov. & Springfield R. R. 4-8½ g. 23 m. 4 lo. 92 c.
Wm. Tinkham, *Gen. Man*.....Providence, R. I
G. T. Richardson, *M. M*........Providence, R. I.
Prov. & Worcester. 4-8½ g. 66 m. 34 lo. 1,155 c.
W. E. Chamberlain, *Supt* ....Providence, R. I.
A. Griggs, *Supt. L. & C. D*....Providence, R. I.
Pullman's Palace Car Co. 564 passenger cars.
A. B. Pullman, *2d V.-Pr. & G. M*.. Chicago, Ill.
Geo. F. Brown, *Gen. Supt*...... ...Chicago, Ill.
Wm. A. Angell, *Pur. Agt*.... ....Chicago, Ill.
S. W. Bretzfield, *Asst. Pur. Agt*.New York, N. Y.
A. Rapp, *Man*. (Chicago Works)...Chicago, Ill.
H. L. Spaulding, *Man*. (Det. Shops).Detroit, Mich.
E. A. Benson, *Supt. Shops*... ... St. Louis, Mo.

Q

Quebec Central Ry. 4-8½ g. 147 m. 10 lo. 267 cars.
J. R. Woodward, *Gen. Man*..Sherbrooke, P. Q.
A. Steele, *Supt*.. .... Sherbrooke, Que.
R. D. Morkill, Jr., *Pur. Agt*..Sherbrooke, P. Q.
Jas. Seiveright, *M. M* ...... Sherbrooke, P. Q.
Quebec, Montreal, Ottawa & Occidental Ry.
4-8½ g. 354 m. 36 lo. 993 cars.
L. A. Senecal, *Gen. Supt*........Quebec, Que.
Quebec & Lake St. John Ry. 4-8½ g. 36 m. 3 lo. 55 c.
J. G. Scott, *Manager*.............Quebec, Can.
Frank Fournier, *Supt*.... ...St. Raymond, P. Q.
John T. Eames, *M. M*.. ....St. Raymond, P. Q.
Queen Anne's & Kent and Townsend Branch R. R.
(*See Penna.; (4) Div.*)

R

Raleigh & Augusta Air-Line: Carolina Central.
Raleigh & Gaston R. Rs. 4-8½ g. 436 m. 50 lo. 994 c
John C. Winder, *Gen. Man. & P. A*.Raleigh, N. C.
Raleigh Rds. 4-8½ g. 194 m. 22 lo. 563 cars.
B. R. Harding, *Supt. of Mach*.Raleigh, N. C.
Carolina Cen. R. R. 4-8½ g. 242 m. 26 lo. 431 c.
L. C. Jones, *Supt*... ..Wilmington, N. C.
James Maglenn, *M. of Mach*.Laurinburg, N. C.
S. R. Ethridge, *M. C. B* ...Laurinburg, N. C.
Rensselaer & Saratoga R. R. (*See Del. & Hud. Can. Co.*)
Rhinebeck & Connecticut. (*See Hart. & Ct. Wn.*)
Richmond, Fredericksburg & Potomac R. R.
4-8½ g. 83 m. 15 lo. 146 cars.
E. T. D. Myers, *Gen. Supt* .. Richmond, Va.
T. L. Courtney, *Asst. Supt* ..Richmond, Va.
H. Kuhn, *M. M*.......... ...Richmond, Va.
W. H. Trainham, *M. C. B*. ...Richmond, Va.
Rich., York River & Ches. R. R. (*See Rich. & Dan.*)
Richmond & Alleghany R. R. 4-9 g. 261 m. 19 lo. 837c.
Decatur Axtell, *Rec. & Gen. Man*.Richmond, Va.
M. Sweeney, *Pur. Agt*.. .... ..Richmond, Va
Geo. D. Harris, *M. M. & C. B*....Richmond, Va.
Richmond & Danville R. R. Co.'s Roads.
1,736 miles 218 loco. 3,833 cars.
A. L. Rives, *Gen. Man* ....Richmond, Va
Peyton Randolph, *As. G. Man*..Richmond, Va.
J. P. Minetree, *Pur. Agt*........ Richmond, Va.
R. D. Wade, *Supt. Mo. Po*... ...Richmond, Va.
(1) Rich. & Dan. R. R. 5 g. 847 m. 131 lo. 2,687 cars.
Rich. & Dan. Div.: 5 g. 320 m. 80 lo. 1,797 c
Wm. H. Green, *Supt*....... ....Richmond, Va.
M. M.... ....Richmond, Va.
J. B. Vaughan, *For. Car Sh*...Richmond, Va.
North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, *Supt*.... ....Raleigh, N. C.
W. H. Turrentine, *M. M*. Comp'y's Shops, N. C.
J. C. Holt, *For. Car Sh*.Comp'y's Shop N. C.
Atlanta & Char. Air Line. 5 g. 286m. 31 lo. 415 c.
Narrow-Gauge Branches. 3 g. 80 m. 5 lo. 41 c.
Edmund Berkley, *Supt*....., ...Atlanta, Ga.
T. W. Gentry, *M. M*. .. ..Atlanta, Ga.
Z. T. Smith, *For. Car Sh*.... ... Atlanta, Ga.
(2 Charlotte, Col. & Aug. R. R. 5g. 239 m. 22 lo. 287 c.
G. R. Talcott, *Supt*...........Columbia, S. C.
J. H. Green, *M. M*. (2 roads)...Columbia, S. C.
(3) Columbia & Greenville R. R. 5 g. 297 m. 22 l. 224 c.
G. S. Talcott, *Supt*............Columbia, S. C.
J. O. Meredith, *For. E. & C. Rep*.. do.
(4) Virginia Midland Ry. 4-8½ g. 353 m. 41 lo. 631 c.
W. M. S. Dunn, *Eng. & Supt*.Alexandria, Va.
J. E. Waddey, *M. of M*......Alexandria, Va.
J. T. Nalls, *M. C. B*. .... .Alexandria, Va.
Richmond & Petersburg R. R. 4-8½ g. 25 m. 8 lo. 132 c.
J. R. Kenly, *Supt*..... ....Richmond, Va.
John O'Brien, *M. M*.............Richmond, Va.
Rio Grande R. R. 3-6 g. 22 m. 3 lo. 40 cars.
M. J. Gomila, *Rec. & Gen. Man*.Brownsville, Tex
G. W. Rendall, *M. M*......... Brownsville, Tex.
M. Markwood, *M. C. B*... ....Brownsville, Tex.
Rio Grande & Pecos Ry. 4-8½ g. 27 m. In progress.
W. W. Hungerford, *Man*..........Laredo, Tex.
Rochester & Lake Ontario Ry. 4-8½ g. 6 m. 2 lo. 10 c.
N. B. Ellison, *Man* ....Rochester, N. Y.
Rochester & Pittsb'g. R. R. 4-8½ g. 260 m. 60 lo. 3,146 c.
Geo. E. Merchant, *Gen. Man*...Rochester N. Y.
J. T. Gardiner, *Gen. Supt*.......Buffalo, N. Y.
C. W. Mills, *Supt. M. P*.... ...Rochester, N. Y.
Rock Island & Mercer County R. R., and
Rock I'd & Peoria Ry. 4-8½ g. 113 m. 13 lo. 357 c.
R. R. Cable, *V.-P. & Gen. Supt*..Rock Island, Ill.
R. I. & P. Ry.: H. B. Sudlow, *Supt. & P. A*. do.
Joseph Elder, *M. M*.................Peoria, Ill.
R. I. & M. C. Rd.: B. T. Cable, *Supt*.R'k Island, Ill.
J. H. Parks, *M. M*............. .Rock Island, Ill.
Rogersville & Jefferson R. R. 5 g. 16 m. 1 lo. 6 cars.
C. M. Leuty, *Supt*........ Rogersville, Tenn.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 17 cars.
Eben Hillyer, *Supt*.................. Rome, Ga.
O. W. Harbin, *M. M. & C. B*......... Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4-8½ g. 417 m. 61 lo. 1,831 cars.
H. M. Britton, *Gen. Man. & P. A*.Oswego, N. Y.
Geo. H. Haselton, *S. M. P. & M*..Oswego, N. Y.
E'n Div.: J. D. Remington, *A. Supt*.Watertown, N. Y.
W'n Div.: W. H. Chauncey, *A. Supt*.Oswego, N. Y.
Roodhouse & Scottsville Ry. In progress.
Geo. P. Merrill, *Gen. Man*..........Chicago, Ill.
Ruby Hill R. R. (*See Eureka & Pal.*)
Rumford Falls & Buckfield R. R. 4-8½ g. 29 m. 2 l. 62 c.
L. L. Lincoln, *Supt. & Pur. Agt*...Canton, Me.

S

Sabine & East Texas Ry. (*See Cen. Pac.*)
Sacramento & Placerville R. R. (*See Cen. Pac.*)
Saginaw Bay & Northw'n R. R. 4-8½ g. 31 m. 6 lo. 136 c.
J. Jackson, *Gen. Man*.... ...Pinconning, Mich.
F. T. Lillote, *Act. Pur. Agt*...Pinconning, Mich.
Edward Keeler, *M. M*........Pinconning, Mich.
Saginaw, Tuscola & Huron R. R.
3 g. 50 m. 3 lo. 83 cars.
M. B. Wilkinson, *Gen. Supt*..E. Saginaw, Mich.
Saginaw Valley & St. Louis R. R. 4-8½ g. 39 m. 4 l. 64 c
N. W. Merrill, *Supt* ....Saginaw, Mich.
Allan Bourn, *Pur. Agt*.. ....Detroit, Mich.
Geo. C. Watrous, *M. M*.. .. ..Iona, Mich.
Salisbury R. R. 4-8½ g. 11 m. 1 lo. 1 car.
R. J. Batzer, *Supt*...............Pittsburgh, Pa.
Salt Lake & Western R. R. (*See Un. Pac.; (6) Div.*)
San Francisco & No. Pac. 4-8½ g. 139 m. 11 lo. 245 c.
Arthur Hughes, *Gen. Man*..San Francisco, Cal.
H. C. Whiting, *Supt*......... ...San Safael, Cal.
Ed. Reynolds, *Gen. M. M*.........Donahue, Cal.
Ed. Reynolds, *M. C. B*.......... Donahue, Cal.
Sanborn, Cooperstown & Turtle M. R. R. In progress.
C. A. Roberts, *Gen. Man*. .. .. Sanborn, Dak.
Sandy River R. R. 2 g. 18 m. 3 lo. 36 cars.
N. B. Beal, *Pres. & Supt* ....Phillips, Me.
M. Saunders, *M. M. & C. B*...... ..Phillips, Me.
Sandusky, Mansfield & Newark R. R. (*See B. & O.*)
Sanford & Indian River R. R. (*See So. Flor.*)
San Luis Obispo & Santa Maria R. R.
3 g. 20 m. 2 lo. 30 cars.
Charles Goodall, *Man*......San Francisco, Cal.
San Pete Valley R. R. 3 g. 33 m. 2 lo. 57 cars.
F. C. Hand, *Supt*.. ....Wales, U. T.
J. E. Bamberger, *Pur. Agt*.... Salt Lake, U. T.
B. Bates, *M. M*....................Wales, U. T.
Santa Cruz R. R. (*See So. Pac.; Nor'n Div.*)
Saratoga, Mt. McGregor & Lake George R. R.
3 g. 11 m. 3 lo. 12 cars.
John McGee, *Supt*. ....Saratoga Springs, N. Y.
Savannah, Florida & W'n Ry. 5 g. 425 m. 50 lo. 736 c.
H. S. Haines, *Gen. Man*........Savannah, Ga.
R. G. Fleming, *Supt*.... ....Savannah, Ga.
F. S. Pendergast, *Ch. Eng*........Savannah, Ga.
A. A. Aveilhé, *Pur. Agt*..........Savannah, Ga.
G. M. D. Riley, *M. of Mach*......Savannah, Ga.
E. Giffken, *For. Car Dept*. .....Savannah, Ga.
Sav., Griffin & No. Ala. R. R. *Op. by Central (Ga.).*
Schuylkill & Lehigh R. R. (*See Phil & Read.*)
Scoharie Valley R. R. (*See Middleburg & Sch.*)
Scioto Valley R. R. 4-8¾ g. 132 m. 17 lo. 548 cars.
Geo. Skinner, *Supt. & P. Agt*.....Columbus, O.
R. Bromley, *M. M*. ....Portsmouth, O.
Seaboard & Roanoke R. R. 4-8½ g. 80 m. 21 lo. 384 c.
E. G. Ghio, *Mast. of Trans*....Portsmouth, Va.
J. A. Walton, *Pur. Agt*........Portsmouth, Va.
M. M. Pendleton, *S. M. P. & M*.Portsmouth, Va.
Sedalia, Warsaw & Southern Ry. (*See Mo. Pac.*)
Sharpsville R. R. 4-8½ g. 23 m. 3 lo. 13 cars.
Walter Pierce, *Gen. Man*.......Sharpsville, Pa.
Shell Beach R. R. 5 g. 22 m.
M. R. Spelman, *Supt* ....New Orleans, La.
Shenandoah Valley R. R. 4-9 g. 249 m. 32 lo. 849 c.
Norfolk & Western R. R. 5 g. 486 m. 82 lo. 1,779 c.
J. H. Sands, *Gen. Supt* .... .Roanoke, Va.
W. C. De Armond, *Pur. Agt*. ..Philadelphia, Pa.
Chas. Blackwell, *Supt. of M. P*...Roanoke, Va.
W. A. Morgan, *M. C. B*.........Lynchburg, Va.
Sh. Val. Rd.: D. W. Flickwir, *Supt*., Roanoke, Va.
N. & W.; W. Div.: Frank Huger, *Supt.;* and
N. & W.; E. Div.: N. M. Osborne, *Supt.;* and
J. T. Robinett, *M. M*. . ..... Petersburg, Va.
Shenango & Allegheny R. R 4-9½ g. 57 m. 8 lo. 248 c.
J. T. Blair, *G. Man. & Pur. Agt*.Greenville, Pa.
Edw. Richardson, *M. M. & C. B*.Greenville, Pa.
Shepaug R. R. 4-8½ g. 38 m. 3 lo. 28 cars.
Edwin McNeill, *Supt*.............Litchfield, Ct.
F. J. Broughet, *M. M*.......... Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 23 cars.
C. L. Harris, *Supt. & Pur. Agt*....Ripley, Miss
W. H. Phelps, *M. M*...............Ripley, Miss.
Silver City, Deming & Pacific R. R. 3 g. 47 m. 3 l. 141 c.
John W. Smith, *Gen. Supt*....Silver City, N. M.
Silver Lake Ry. 4-8½ g. 6 m. 1 lo. 4 cars
S. L. Chapin, *Supt*............... ..Perry, N. Y.
Sinaloa & Durango R. R. 4-8½ g. 38 m. 2 lo. 40 cars.
Geo. S. Skilton, *Supt*......Altata, Sinaloa, Mex.
John E. Bell, *M. M*...............Culiacan, Mex.
Skaneateles R. R. 4-8½ g. 5 m. 2 lo. 5 cars.
J. McNamara, *Supt*........Skaneateles, N. Y.
Sioux City & Pacific R. R. 4-8½ g. 427 m. 28 lo. 785 c.
P. E. Hall, *Gen. Man. & P. A*.Cedar Rapids, Ia.
C. M. Lawler, *Gen. Supt*....Missouri Valley, Ia.
R. W. Hamer, *Pur. Agt*.. ....Chicago, Ill.
W. G. Brownson, *Asst. Supt*.... .Norfolk, Neb.
S. A. Teal, *M. M*....... ....Missouri Valley, Ia.
W. H. Ramseyer, *M. C. B*. ..Missouri Valley, Ia.
Smyrna & Delaware Bay R. R. (*See Kent County.*)
Sodus Bay & Southern Ry. 4-8½ g. 34 m. 4 lo. 40 c.
G. H. Stearns, *Gen. Man*. ..Sodus Point, N. Y.
G. H. Stearns, *Supt. & Pur. Agt*.Sodus Point, N. Y.
F. H. Garlock, *M. M*........Sodus Point, N. Y
C. H. Hill, *M. C. B* ....Sodus Point, N. Y.
Somerset R. R. 4-8½ g. 25 m. 3 lo. 24 cars.
W. M. Ayer, *Supt & Pur. Agt*......Oakland, Me.
S. P. Mosher, *For. Car Rep*....No. Anson, Me.
C. Crowell, *For. Lo. Rep's*.....No. Anson, Me.
Somerset & Cambria R. R. (*See B. & O.*)
Sonora Ry. (*See A., T. & S. Fe.*)
Sonoma Valley:
Arthur Hughes, *Gen. Man*.San Francisco, Cal.
H. C. Whiting, *Supt*............San Rafael, Cal.
J. T. Peters, *Asst. Supt*........Glen Ellen, Cal.
Ed Reynolds, *M. M*... .... Donahue, Cal.
South & North Alabama R. R. (*See Louis. & Nash.*)
South Carolina Ry. 5 g. 246 m. 46 lo. 834 cars.
John B. Peck, *Gen. Man*. ......Charleston, S. C.
S. B. Pickens, *Pur. Agt*........Charleston, S. C.
P. J. Cochrane, *Mast. of Mach*.Charleston, S. C.
Geo. H. Gramling, *M. C. B*....Charleston, S. C.
South-Eastern Ry. 4-8½ g. 280 m. 30 lo. 1,000 cars.
T. A. McKinnon, *Gen. Man*.....Montreal, Can.
A. G. Eastman, *M. M*..........Farnham, P. Q.
South Florida R. R. 3 gauge 115 m. 13 lo. 250 cars.
B. R. Swoope, *Supt. & P. A*....... Sanford, Fla.
R. Derby, *M. M*........... ......Sanford, Fla.
A. D. Stentiford, *M. C. B*..........Sanford, Fla.
South Mountain R. R. 4-8½ g. 18 m. 4 lo. 22 c.
W. H. Woodward, *Supt*. Pine G've Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 16 lo. 500 cars
M. Fillmore, *Supt*.... .....San Francisco, Cal.
G. H. Waggoner, *Pur. Agt*..San Francisco, Cal.
D. E. Arnold, *M. M. & C. B* ....Newark, Cal.
South-Western R. R. (Ga.) (*See Central of Ga.*)
South-Western Ry. (Ky.) 4-8½ g. 4 m. 1 lo. 38 cars.
J. M. Wilson, *Supt*............Harrodsburg, Ky.
J. Tomlinson, *Pur. Agt*......Harrodsburg, Ky.
Southern Central R. R. 4-8½ g. 156 m. 21 lo. 467 c.
James G. Knapp, *Gen. Supt. & P. A*.Auburn, N. Y
John White, *M. M*... ....Auburn, N. Y.
H. Mooney, *M. C. B*..............Auburn, N. Y.
Southern Kansas Ry. (*See At., Top. & Santa Fe.*)
Southern Maryland R. R. 4-8½ g. 20 m. 1 lo. 20 c.
Robert Knight, *Supt*. ....Brandywine, Md.
C. R. Joyce, *M. M*.......... ..Brandywine, Md.
Southern Pacific R. R. 4-8½ g. 198 m. 30 lo. 728 c.
Northern Div. (*For other Divs. see Cen. Pac.*)
A. C. Bassett, *Supt*......San Francisco, Cal
J. R. Watson, *Pur. Agt*.....Sacramento, Cal.
J. T. Wilson, *M. M*..... ..San Francisco, Cal.
F. N. Bellisle, *M. C. B*. ...San Francisco, Cal.
Southern Pacific R. R. of Arizona. (*See Cen. Pac.*)
Southern Pacific R. R. of New Mexico. (*See Cen. Pac.*)
Spartanburg, Union & Columbia R. R.
(*See Rich. & Dan.; (3) Div.*)
Spring Brook R. R. 4-3 g. 8 m. 1 lo. 18 cars.
Charles Pugh, *Pres*.......... ... ..Pittston, Pa.
Spring Hill & Parrsboro Ry. (*See Cumberland.*)
Springfield, Effingham & So.-E'n Ry. (*See Ind. & Ill.*)
Springville & Sardinia Ry. 4-8½ g. 12 m. 1 lo. 8 c.
Bertrand Chaffee, *Pres*......Springville, N. Y.
St. Croix & Penobscot R. R. 4-8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, *Supt. & Pur. Agt*. .Calais, Me.
G. H. Corsen, *M. M*....... .... ..Milltown, Me
H. C. Tincker, *M. C. B*...........Milltown, Me.
St. Helen, Houghton Lake & West. R. R. 4-8½ g. 13 m.
Z. C. Jessop, *Gen. Man*.... ...Detroit, Mich.
St. John & Maine Ry. (*See New Brunswick.*)
St. John's Ry. 4-8½ g. 14½ m. 2 lo. 24 cars.
R. McLaughlin, *Pr. & Supt*. .Jacksonville, Fla.
Geo. Ferro, *M. of Mach*.. ....Tocoi, Fla.
St. John's & Lake Eustis Ry. 3 g. 36 m.
W. J. Jarvis, *Supt*............. Ft. Mason, Fla.
St. Johnsb'ry & Lake Champ. 4-8½ g. 120 m. 10 lo. 372 c.
A. B. Jewett, *Supt. & P. A*..St. Johnsbury, Vt.
Geo. E. Howe, *M. M. & C. B*.St. Johnsbury, Vt.
St. Joseph Valley R. R. 3 g. 15 m. 1 lo. 11 cars.
E. T. Chase, *Gen. Man*..Berrien Springs, Mich.
St. Joseph & Des Loge Ry. 3 g. 13 m. 4 lo. 70 cars.
T. T. Onderdonk, *Supt*..... Bonne Terre, Mo.
St. Joseph & Western R. R. (*See Union Pac.; (1) Div.*)
St. Joseph & Des Moines R. R. (*See K. C., St. J. & C. B.*)
St. Lawrence & Ottawa Ry. (*See Can. Pac.*)
St. Louis, Alton & Terre Haute R. R.
Main Line. (*See C., C., C. & I.; Ind. & St. L. Div.*

St. Louis & Cairo Div.: 4–8½ g 137 m. 17 lo. 800 c
G. W. Parker, *Gen. Man*.......St. Louis, Mo.
J. L. Hinckley, *Supt*... ... .Belleville, Ill.
A. M. De Clerq, *M. M*..........St. Louis, Mo.
St. Louis Bridge Co. and Tunnel R. R.
4–8½ g. 31 m. 22 lo. 11 cars.
Wm. Taussig, *Gen. Man*..........St. Louis, Mo
A. W. Dickinson, *Supt*.... ....St. Louis, Mo.
J. E. Williams, Jr., *Pur. Agt*....St. Louis, Mo.
H. M. Smith, *M. M*................St. Louis, Mo.
St. Louis, C. Cœur & St. Ch. Ry. 3 g. 16 m.
F. M. Colburn, *Gen. Man*... .. St. Louis, Mo.
St. Louis Coal R. R. 4–8½ g. 93 m. 10 lo. 217 cars.
Jas. Prentice, *Supt*.......... ....Carbondale, Ill.
Jas. C. Bryden, *Pur. Agt*... ....St. Louis, Mo.
St. Louis, Des Moines & Northern Ry. 4–8½ g. 43 m.
C. F. Merk, *Supt*..............Des Moines, Ia.
St. L., Ft. Scott & Wichita R.R. 4–8½ g. 160 m. 61.337 c.
J. W. Miller, *V. P. & Gen. Man*..Fort Scott, Kan.
Tho. N. Lewis, *Asst. Supt*......Fort Scott, Kan.
Tho. N. Lewis, *Pur. Agt*.... ..Fort Scott, Kan.
Henry Berger, *M. M* ....Ft. Scott, Kan.
A. A. Liddell, *M. C. B*........ ..Ft. Scott, Kan.
St. L., Hannibal & Keokuk. 4–8½ g. 85 m. 5 lo. 70 c.
W. W. Walker, *Gen. Supt*....... Hannibal, Mo.
Geo. Douglass, *Pur. Agt*.........Hannibal, Mo.
St. Louis, Iron Mt. & So'n Ry. (*See Mo. Pac.; (4) Div.*)
St. L., Keokuk & No.-W'n. Ry. (*See C., B. & Q.*)
St. L., Salem & Little Rock. 4–9 g. 72 m. 5 lo. 111 c.
H. A. Crawford, *V. Pr. & P. A*...St. Louis, Mo.
E. B. Sankey, *Supt*..................Salem, Mo.
Thomas Everson, *M. M*. ....Steelville, Mo
J. W. Houston, *M. C. B*..........Steelville, Mo.
St. Louis & Cairo R. R. 3 g. 152 m. 22 lo. 896 cars.
Chas. Hamilton, *Gen. Supt*..... .St. Louis, Mo.
T. W. Newell, *M. M*..........E. St. Louis, Mo.
St. L. & San Fran. Ry. 4–8½ g. 902 m. 88 lo. 3,000 c.
C. W. Rogers, *V. P. & Gen. Man*..St. Louis, Mo.
D. H. Nichols, *Mast. Tran*..No. Springfield, Mo.
A. T. Mann, Jr., *Pur. Agt*........St. Louis, Mo.
M. Kearney, *M. M. & C. B*..No. Springfield, Mo.
East Div.: A. Veech, *Supt*...... ...St. Louis, Mo.
Central Div.: W. A. Thoms, *Supt*..Springfield, Mo.
Kan. Div.: J. R. Wentworth, *Supt*. Neodesha, Kan.
St. Martin's & Upham Ry. 4–8½ g. 30 m. 2 lo. 8 cars.
A. E. Killam, *Manager*........St. Martin's, N. B.
St. Paul Eastern Grand Trunk Ry. 4–8½ g. 15 m.
D. C. Lamb, *Gen. Supt*..... ......Oconto, Wis.
St. Paul, Minneapolis & Manitoba Ry.
4–8½ g. 1,402 m. 201 lo. 5,068 cars.
A. Manvel, *Gen. Man*............St. Paul, Minn.
E. B. Wakeman, *Asst. Gen. Supt*. St. Paul, Minn.
J. C. Morrison, *Pur. Agt*........St. Paul, Minn.
H. Middleton, *M. M. & C. B* ... St. Paul, Minn.
Breck. Div.: W. S. Kemp, *Supt*...St. Paul, Minn.
F. F. Div.: J. B. Rice, *Supt*........St. Paul, Minn.
No'n Div.: A. Guthrie, *Supt*.....Crookston, Minn.
St. Paul & Duluth R. R. 4–8½ g. 225 m. 37 lo. 1,080 c.
W. H. Fisher, *Gen. Supt*..... ..St. Paul, Minn.
J. G. Callahan, *Pur. Agt*.........St. Paul, Minn.
Chas. F. Ward, *M. M. & M. C. B*..St. Paul, Minn.
State Line & Sullivan R. R. 4–8½ g. 25 m. 3 lo. 263 c.
I. O. Blight, *Supt*................Towanda, Pa.
Staten Island R. R. 4–8¼ g. 13 m. 4 lo. 18 c
J. W. Wilbur, *Supt*............New York, N. Y.
Stony Clove & Catskill Mountain R. R.
3 g. 14 m. 2 lo. 22 cars.
Geo. Coykendall, *Gen. Supt*....Rondout, N. Y
Stony Creek R. R. 4–8½ g. 11 m
Geo. B. Boggs, *Supt* .... Norristown, Pa.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 145 cars.
J. C. Missimer, *Supt*..........Sloatsburg, N. Y.
Suffolk Lumber R. R. 3 g. 15 m. 3 lo. 41 cars.
W. M. Whaley, *Supt*.. ....Suffolk, Va.
Summit Branch R. R. 4–9 g. 20 m. 7 lo. 10 cars.
Thomas Gucker, *Supt*........Williamsport, Pa.
Susquehanna & Delaware River R. R. In progress.
D. Y. Kilgore, *Pres*............Philadelphia, Pa.
Sussex R. R. (*See Del., Lack. & West.*)
Syracuse, Binghamton & N. Y. R. R. (*See D. L. & W.*)
Syr., Ontario & N. Y. R. R. (*See N. Y., W. Sh. & Buf.*)
Syracuse, Geneva & Corning; Corning, Cowanasque & Antrim R. Rs. 4–8½ g. 142 m. 28 lo. 1,044 c.
A. H. Gorton, *Supt*...... ......Corning, N. Y.
W. E. Gorton, *Asst. Supt*.........Corning, N. Y.
Andrew Beers, *Pur. Agt*.. .....Corning, N. Y.
O. C. Patchell, *M. M*.............Corning, N. Y.
C. J. Butler, *M. C. B*............Corning, N. Y.

T

Tennessee Coal R. R. 5 g. 28 m. 8 lo. 204 cars.
A. M. Shook, *Gen. Man*......Tracy City, Tenn.
W. A. Knight, *M. M*......... Tracy City, Tenn.
Tennessee & Sequatchee Valley R. R.
3 g. 42 m. 1 lo. 24 cars.
Chas. Clinton, *Gen. Supt*....Spring City, Tenn.
P. V. Mooney, *Pur. Agt*......Spring City, Tenn.
Terre Haute & Indianapolis R. R.
4–9 g. 398 m. 105 lo. 4,170 cars.
Joseph Hill, *Gen. Supt*.... ....St. Louis, Mo.
C. R. Peddle, *P. Agt*.......Terre Haute, Ind.
Geo. H. Prescott, *S. M. P. & M*. Terre Haute, Ind.
F. C. Cleaver, *M. M*.........Terre Haute, Ind
E. D. Carter, *M. C. B* ......Terre Haute, Ind.
Chas. Butler, *M. M*..... ....Effingham, Ill.
Clinton Idler, *Foreman* ... Indianapolis, Ind)
Terre Haute & So.-Eastern Ry. 4–9 g. 44 m. 2 lo. 145 c.
Geo. Atherton, *Supt*......... Terre Haute, Ind.
Texas-Mexican Ry. (*See Mex. Nat*..
Texas Trunk R. R. 4–8½ g. 36 m. 2 lo. 8 cars.
Hugh Irwin, *Gen. Supt*...........Dallas, Tex.
Texas Western Ry. 3 g. 52 m. 2 lo. 44 cars.
Henry Hatch, *Gen. Man*.... ....Houston, Tex.
T. F. Glispin, *M. M*...............Houston, Tex.
Texas & N. O. R. R. (*See Cen. Pac.; G. H. & S. A. Div.*)
Texas & Pacific. (*See Mo. Pac. Ry.; (6) Div.*)
Texas & St. Louis Ry. 3 g. 769 m. 84 lo. 2,000 cars.
W. R. Woodard, *Rec*.. ....St. Louis, Mo.
J. J. Frey, *Gen. Supt*....... ....St. Louis, Mo.
C. S. Brooks, *Pur. Agt*.... ....St. Louis, Mo.
S. M. P. & M ...St. Louis, Mo.
Tex. Div.: J. T. Gerry, *Supt*. ....Tyler, Tex.
P. J. Milan, *M. M*............ ....Tyler, Tex.
Tionesta Valley R. R. 3 g. 15 m
George Dickinson, *Gen. Supt* .... Sheffield, Pa.
Tioga R. R 4–8½ and 6 g. 67 m. 18 lo. 960 cars.
R. Dupuy, *Supt*.... ....Blossburg, Pa.
J. C. Guthrie, *Pur. Agt*... ...New York, N. Y.
Pere Bonny, *M. M*...............Blossburg, Pa.
D. H. Stratton, *M. C. B*...... .Blossburg, Pa.
Toledo, Ann Ar. & No. Mich. Ry.
4–8½ g. 63 m. 9 lo. 186 c.
J. M. Ashley, *Gen. Man*......Ann Arbor, Mich.
H. W. Ashley, *Supt. & Pur. Agt*. do
C. C. Dodge, *M. M*............Ann Arbor, Mich.
Toledo, Cin. & St. Louis R. R. 3 g. 798 m. 101 lo. 3.500 c.
E. P. Murray, *Gen. Supt*.... ....Toledo, O.
F. W. Stewart, *P. Agt*.................Toledo, O.
L. W. James, *Supt. Mach*....... ..Delphos, O.
Toledo Div.: W. H. Vandergrift, *Supt*.; do
Thos. Robertson, *M. M*..... .....Delphos, O.
J. S. Wiers, *For. Car Rep*........Delphos, O.
Del. & Cin. Divs.: C. A. Bell, *Supt*........Cin., O.
T. J. Hamer, *M. M* ....Cincinnati, O.
So.-Ea. Div. and Dayton Div.:
C. E. Henderson, *Gen. Man* ......Dayton, O.
W. H. Anderson, *M. M*............Dayton, O.
St. Louis Div.: Frank F. Allen....Charleston, Ill.
P. H. Murphy, *M. M* .. ..Charleston, Ill.
Ironton Div.: C. C. Clark, *Supt*. ....Ironton, O.
Dayton Div.: J. E. Gimperling, *Supt*..Dayton, O.
Toledo & Indianapolis R. R. 4–8½ g. 43 m. 4 lo. 118 c.
M. Clark, *Supt*.... ....Toledo, O.
H. M. Swan, *M. M*. ....Toledo, O.
Toledo & South Haven R. R. (*See Paw Paw.*)
Tonawanda Val. & Cuba R. R. (*See Brad., B. & K.*)
Toronto, Grey & Bruce Ry. 4–8½ g. 191 m. 28 l. 446 c.
Edmund Wragge, *Gen. Man*... .Toronto, Can.
W. Watson, *Pur. Agt* .... Toronto, Can.
David Preston, *M. M*............ Toronto, Can.
Toronto & Nipissing Ry. (*See Mid. Ry. of Can.*)
Troy & Boston R. R. 4–8½ g. 48 m. 20 lo. 484 cars.
O. Robinson, *Pres. & Pur. Agt*......Troy, N. Y.
Joseph Crandell, *Supt*. ....Troy, N. Y.
Z. B. Davis, *M. M* ....Troy, N. Y.
A. Brewer, *M. C. B*.................Troy, N. Y.
Troy & Greenfield R. R. & H. Tunnel. 4–8½ g. 44 m.
A. W. Locke, *Man*.........North Adams, Mass.

Tuckerton R. R. 4–9 g. 31 m. 2 lo. 29 cars.
J. J. Pharo, *Supt. & Pur. Agt*. Tuckerton, N. J.

U

Ulster & Delaware R. R. 4–8½ g. 74 m. 10 lo. 214 cars.
Jas. H. Jones, *Supt*.............Rondout, N. Y.
Joseph Rush, *M. M* ....Rondout, N. Y.
John H. Decker, *M. C. B*........Rondout, N. Y.
Union Pacific Ry. (7 Gen. Divs.)
3 & 4–8½ g. 4,633 m. 510 lo. 10,550 cars.
S. R. Callaway, *Gen. Man*....... ..Omaha, Neb.
Thos. L. Kimball, *Asst. Gen Man*. Omaha, Neb.
M. H. Goble, *Pur. Agt*............Omaha, Neb.
I. H. Congdon, *S. M. P. & C. D*...Omaha, Neb
John Wilson, *Asst. do*.............Omaha, Neb.
(1) Neb. Div.: P. J. Nichols, *Gen. Supt*..Omaha, Neb.
E. Div.: C. B. Havens, *Supt*.. .....Omaha, N. B.
R. McConnell, *M. M*........... Omaha, Neb.
A. M. Collett, *M. C. B*...........Omaha, Neb.
E. Sleppy, *M. M*..............G. Island, Neb.
L. Pole Div.: W. A. Deuel, *Supt*..Cheyenne, W. T.
J. H. McConnell, *M. M*. ....N. Platte, Neb.
R. McDougall, *M. M*.........Cheyenne, W. T.
(2) Wy. Div.: E. Dickenson, *Gen. Supt*..Laramie, W. T.
T. E. Lewis, *M. M* ....Laramie, W. T.
T. A. Davis, *M. M*............Rawlins, W. T.
Wes. Div.: C. E. Wurtelle, *Supt*. Evanston, W. T.
Geo. F. Chapman, *M. M*.......Evanston, W. T.
(3) Idaho Div.: W. B. Doddridge, *Gen. Supt*. Ogden, U.
F. Rearden, *M. M*. .... Pocatello, Id.
Ogden Short Line Div.:
R. Blickensderfer, *Supt*.... .. Pocatello, Id.
Utah & Northern Div.:
W. P. P. St. Clair, *Supt*.......Eagle Rock, Id.
W. J. Hemphill, *M. M*.......Eagle Rock, Id.
W. J. Hemphill, *M. M*. ....Eagle Rock, Id.
J. W. Paul, *Gen. For. C. D*.. .Eagle Rock, Id.
(4) Col. Cent. Div.: A. A. Egbert, *Gen. Supt*. Denver, Col.
F. Meirtsheimer, *M. M*..........Denver, Col.
C. C. Div.: P. Touhy, *Supt*..........Denver, Col.
So. Park Div.: D. K. Sweet, *A. Supt*..Como, Col.
(5) Kan. Div.: S. T. Smith, *G. Supt*..Kansas City, Mo.
K. Pac. Div.: J. O. Brinkerhoff, *Supt*. Kan. C'y, Mo.
J. O. Chapman, *M. M*. .....Armstrong, Kan.
T. B. Roberts, *M. C. B*......Armstrong, Kan.
Kansas Central Div.:
J. O. Brinkerhoff, *Supt*..Leavenworth, Kan.
Smoky Hill Div.:
O. H. Dorance, *Supt*..........Wallace, Kan.
J. B. Dailey, *M. M*. ....Ellis, Kan.
(6 Salt Lake & Western Div.:
W. W. Ritter, *Supt*......Salt Lake City, Utah.
7) Nevada Central Ry. 3 g. 93 m. 4 lo. 78 cars.
F. W. Dunn, *Gen. Supt. & P. A*. Battle Mt., Nev.
Z. T. Sprigg, *M. M*........Battle Mountain, Nev.
United States Rolling Stock Co. 19 lo. 4,692 cars.
A. Hegewisch, *Pres*............New York, N. Y.
W. H. Chaddock, *Gen. Agt*........Chicago, Ill.
Upson County R. R. (*See Central of Ga.*)
Utah Central Ry. 4–8½ g. 280 m. 21 lo. 358 cars.
John Sharp, *Gen. Supt*...Salt Lake City, Utah.
S. H. Hill, *Pur. Agt*.......Salt Lake City, Utah.
Geo. G. Bywater, *M. M*..Salt Lake City, Utah
Peter Reid, *M. C. B*.......Salt Lake City, Utah.
Utah & Nevada Ry. 3 g. 37 m. 3 lo. 33 cars
W. W. Ritter, *Gen. Man*...Salt Lake City, Utah.
Robert Anderson, *M. M*...Salt Lake City, Utah.
Utah & Northern Ry. (*See Union Pac.; (3) Div.*)
Utah & Pleasant Valley Ry. (*See Den. & Rio. Gr.*)
Utica, Ithaca & Elmira Ry. 4–8½ g. 120 m. 11 lo. 152 c.
Geo. S. Sadler, *Supt* ...., Elmira, N. Y.
Edw. Mahler, *Pur. Agt*............Elmira, N. Y.
C. J. Howe, *M. M. & M. C. B*..Breesport, N. Y.
Utica, & Black Riv. R. R. 4–8½ g. 180 m. 22 lo. 452 c.
J. F. Maynard, *Gen. Supt. & P. A*..Utica, N. Y.
John Bailey, *M. M*..................Utica, N. Y.
David James, *M. C. B*..............Utica, N. Y.

V

Vaca Vall. & Clear Lake R. R. 4–8½ g. 30 m. 2 lo. 19 c.
G. B. Stevenson, *Gen. Supt*... .Vacaville, Cal.
Valley Ry. (Ohio) 4–8¾ g. 85 m. 21 lo. 889 cars.
Isaac Reynolds, *Gen. Man*.... . .Cleveland, O.
J. E. Turk, *Supt*... .... Cleveland, O.
H. Melcher, *Pur. Agt*............Cleveland, O.
Valley R. R. Va. 4 8½ g. 62 m
S. Spencer, *Pres*.. ....Baltimore, Md.
Vermont Valley R. R. (*See Conn. River.*)
Vicksburg & Brunswick R. R. (*See Cen. of Ga.*)
Vicksburg & Meridian R. R. (*See Cin., N. O. & Tex. Pac.*)
Vicks. Shreveport & Pac. R. R. (*See C., N. O. & T. P.*)
Victoria Ry. (*See Midland Ry. of Can.*)
Virginia Midland Ry. (*See Rich. & Dan.; (4) Div.*)
Virginia & Truckee R. R. 4–8½ g. 54 m. 17 lo. 375 c.
Carson & Colorado R. R. 3 g. 294 m. 6 lo. 134 c
H. M. Yerington, *Gen. Supt*... .. Carson, Nev.
R. J. Laws, *Supt*. (C. & Col.)..Hawthorne, Nev.
Hume Yerington, *Pur. Agt*........Carson, Nev.
I. N. Fording, *M. M*.. ....Carson, Nev.
M. M. Hyde, *M. C. B*.......... . Carson, Nev.

W

Wabash, Chester & W'n R. R. (*See St. Louis Coal.*)
Wabash, St. Louis & Pacific Ry. (4 Gen. Divs.)
4–8½ g. 3,241 m. 598 lo. 17,230 cars.
A. L. Hopkins, *2d V. P*......... St. Louis, Mo.
A. A. Talmage, *Gen. Man*... ...St. Louis, Mo.
R. B. Lyle, *Pur. Agt*.............St. Louis, Mo.
Jacob Johann, *Gen. M. M*......Springfield, Ill.
M. M. Martin, *Gen. M. C. B*......;....Toledo, O.
(1) Eas'n Div.: G. W. Stevens, *Supt*........Peru, Ind.
J. B. Barnes, *M. M*.........Fort Wayne, Ind.
John McKenna, *M. M*............ Peru, Ind.
Cairo Div.: *M. M*.......Carmi, Ill.
Rant'l Div.: B. F. Mathias, *Asst. Supt*. Rantoul, Ill.
J. McCarthy, *M. M*.......... ....Rantoul, Ill
(2) Middle Div.: H. F. Clark, *Supt*....Springfield, Ill.
B. B. Rose, *M. C. B*..............Decatur, Ill.
G. A. Hurd, *Asst. Supt*. ....Forest, Ill.
(3) Northern Div.: E. N. Armstrong, *Supt*. Decatur, Ill.
R. M. Hemphill, *M. C. B*..........Peoria, Ill.
E. B. Hyde, *Asst. Supt*.......... Havana, Ill.
(4) Western Div.: R. S. Miner, *Supt*.....Moberly, Mo
W. H. Selby, *M. M*................Moberly, Mo.
C. S. Buck, *M. C. B*................Moberly, Mo.
E. Dresser, *Asst. Supt*............Stanberry, Mo
D. Moin. Div.: C. F. Meek, *A. Supt*. Des Moines, Ia
Walden's Bridge R. R. 3 g. 23 m. 3 lo. 37 cars.
John G. Scott, *Gen Man*....Jenks P. O., Tenn.
Wallkill Valley.
J. E. Childs, *Gen. Supt*........New York, N. Y.
Geo. H. Graves, *Supt*.... ......Kingston, N. Y.
E. Minshull, *M. M*........ ...Middletown, N. Y.
I. W. Fowler, *Pur. Agt*..... .Middletown, N. Y.
Walla Walla & Columbia Riv. R. R. (*See Ore. Ry.*)
Walton R. R. 5 g. 10 m. 1 lo. 7 cars.
D. H. Walker, *Pres*................Monroe, Ga.
Warren & Farnsworth Valley R. R.
3 g. 11 m. 3 lo. 39 cars.
A. D. Wood, *Supt*.......... ....Warren, Pa.
Warwick Valley R. R. (*See Leh. & Hud. River.*)
Wasatch & Jordan Valley R. R. (*See Den. & Rio. Gr.*)
Washington, Ohio & West. R. R. 4–8½ g. 52 m. 5 lo. 87 c.
S. M. Brophy, *Supt*.... .... Alexandria Va.
W. Mountjoy, *Act. For*.........Alexandria, Va
John Harrison, *M. C. B*........Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 29 m. 3 lo. 26 c.
C. E. Bower, *Supt*...... ....Waynesburg, Pa.
A. M. Kline, *M. C. B*.... .....Waynesburg, Pa.
Welland Ry. 4–8½ g. 25 m. 4 lo. 147 cars.
William Pay, *Supt*.........St. Catharines, Ont.
Jas. Taylor, *M. M*... ......St. Catharines, Ont.
Wm. H. Pay, *M. C. B*......St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m. 3 lo. 13 c.
Rolla Wells, *Supt*............ . St. Louis, Mo.
M. M. Hodgman, *M. M*..........Florissant, Mo.
West Feliciana R. R. 4–8½ g. 27 m. 2 lo. 22 cars
J. B. McGehee, *Pr. & Gen. Supt*. Bayou Sara, La.
J. A. Tilton, *M. M. & C. B*.....Bayou Sara, La.
W. Va., Central & Pittsb'g Ry. 4–8½ g. 50 m. 4 lo. 119 c.
T. B. Davis, *Gen. Man*........Piedmont, W. Va.
W. E. Porter, *Gen. Supt*......Piedmont, W. Va
Geo. W. Harrison, *Pur. Agt*...Piedmont, W. Va.
E. W. Lippencott, *M. M*.....Piedmont, W. Va.
West & East R. R. (*See Ill. Cen.; N. O. Div.*)
West Jersey R. R. (*See Penn. R. R.; (3) Div.*)
Western R. R. (of Ala.) 5 g. 85 m. 15 lo. 270 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 240 c.
Cecil Gabbett, *Gen. Man. & Supt*...Mont., Ala.
C. D. Wall, *M. M. & C. B*....Montgomery, Ala.

Western Counties' Ry. 4–8½ g. 67 m. 8 lo. 137 cars.
J. Brignell, *Supt*. ....Yarmouth, N. S.
Western Maryland R. R. 4–8½ g. 157 m. 25 lo. 439 c.
J. M. Hood, *Pr. & Gen. Man*....Baltimore, Md.
R. J. Adair, *Pur. Agt*............Baltimore, Md.
David Holtz, *Mast. of Mach*..Union Bridge, Md.
J. H. Nussear, *M. C. B*.......Union Bridge, Md.
Western No. Carolina R. R. 5 g. 210 m. 17 lo. 160 c.
V. E. McBee, *Supt*...............Salisbury, N. C.
Jos. P. Minetree, *Pur. Agt*.......Richmond, Va.
G. W. Gates, *M. M*.... ....Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 58 lo. 952 c.
R. A. Anderson, *Gen. Supt*.........Atlanta, Ga.
A. B. Bostwick, *Asst. Supt*..... Atlanta, Ga.
Lamar Collier, *M. M*................Atlanta, Ga
Wm. Kinyoo, *M. C. B*. ....Atlanta, Ga.
Wheeling, Pittsburg & Baltimore R. R. (*See B. & O.*)
Wheeling & Lake Erie R. R. 267 m. 31 lo. 1.456 c.
M. D. Woodford, *Gen. Man*..........Toledo, O
O. P. Dunbar, *Gen. M. M*...........Norwalk, O.
John Hillhouse, *Div. M. M*.........Norwalk, O.
Cleve. & Mar. Div.:
A. Galloway, *Div. M. M*...... Cambridge, O
Whitby, Port Perry & Lindsay Ry. (*See Mid. of Can.*)
White Water R. R. (*See Ft. W., Cin. & Lou.*)
Whitefield & Jefferson R. R. (*See Bos., Con. & Mon.*)
Whitneyville & Machiasport R. R. 8 m. 2 lo. 48 c.
C. Sullivan, *G. M. & Pur. Agt*. Whitneyville, Me.
Wicomico & Pocomoke R. R. 4–8½ g. 30 m. 2 lo. 38 c.
L. Showell, *Pres*............... ....Berlin, Md.
Williamsport & North Branch R. R.
4–8½ g. 9 m. 2 lo. 4 cars.
B. G. Welch, *Man. & P. Agt*..Hughesville, Pa.
J. V. Chamberlain, *Supt. & M. M*. do.
Williamstown & Del. River R. R.
4–8½ g. 9 m. 1 lo. 10 cars.
Samuel Garwood, *Supt* ... Williamstown, N. J.
Wilmington, Columbia & Augusta R. R. (*See W. & W.*)
Wilmington & No'n R. R. 4–8¾ g. 85 m. 16 lo. 148 c.
J. H. Thompson, *Supt. & P. A*..Coatesville, Pa.
George Rommel, *M. M*.........Coatesville, Pa
Alex. Maitland, *M. C. B*...... ..Coatesville, Pa.
Wilmington & Weldon; Northeastern; S. C. Central; Cheraw & Darlington; Cheraw & Salisbury; and Wilmington, Columbia & Augusta R. Rs.
5 g. 599 miles 70 locomotives 1.120 cars.
R. R. Bridgers, *Gen. Man*....Wilmington, N. C.
J. F. Divine, *Gen. Supt*.......Wilmington, N. C.
John Bisset, *M. M*...........Wilmington, N. C.
W. H. Day, *M. C. B*.............Florence, S. C.
J. H. Davis, *M. C. B*. (W. & W.). Wilmington, N. C.
Winifrede R. R. 4–9 g. 5 m. 1 lo. 65 cars.
Theodore Wright, *Pres*........Philadelphia, Pa.
Windsor & Annapolis Ry. 4–8½ g. 130 m. 10 lo. 160 c.
P. Innes, *Gen. Man*.............Kentville, N. S.
Wm. Yould, *M. M*...............Kentville, N. S.
Wm. Grierson, *M. C. B*..........Kentville, N. S.
Wisconsin Central R. R. 4–8½ g. 480 m. 49 lo. 1,800 c
F. N. Finney, *Gen. Man*.........Milwaukee, Wis.
E. K. Howes, *Pur. Agt*........Milwaukee, Wis.
W. A. Short, *Supt. M. P. & M*...Stevens Pt., Wis.
Mil. & E'n Divs.: A. A. Allen, *S*..Milwaukee, Wis.
Wis., Minn. & S. M. & N. Div.:
W. E. Carroll, *Supt*.. ......Stevens Point, Wis.
Wisconsin, Iowa & Nebraska.
B. L. Harding, *Gen. Man*.... ...Des Moines, Ia.
G. C. McMichael, *Supt*.......Marshalltown, Ia.
M. C. Wheeler, *M. M*........Marshalltown, Ia.
Wisconsin & Michigan R. R. (*See Mil. & North'n.*)
Wisconsin & Minnesota R. R. (*See Wis. Cen.*)
Wood River Branch R. R. 4–8½ g. 6 m. 2 lo. 3 cars.
L. M. Barber, *Supt*...........Hope Valley, R. I.
Woodstock R. R. 4–8½ g. 14 m. 1 lo. 3 cars.
J. G. Porter, *Supt*...............Woodstock, Vt.
Worcester, Nashua & Rochester R. R.
4–8½ g. 95 m. 20 lo. 523 cars.
C. S. Turner, *Pres. & G. Man*. Worcester, Mass.
G. W. Hurlburt, *Supt*.........Worcester, Mass.
John G. Brady, *M. M. & C. B*. Worcester, Mass
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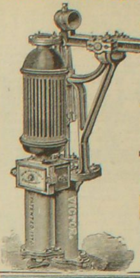

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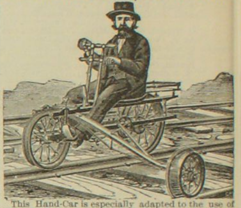

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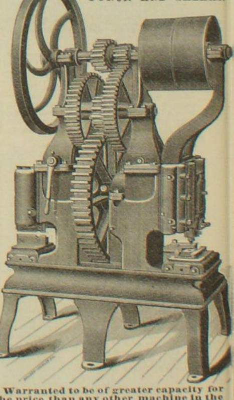

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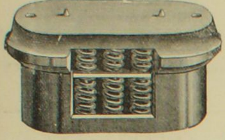

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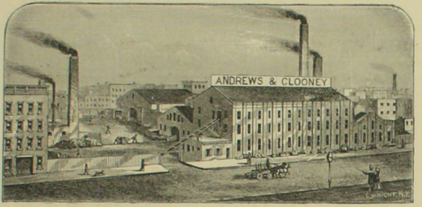

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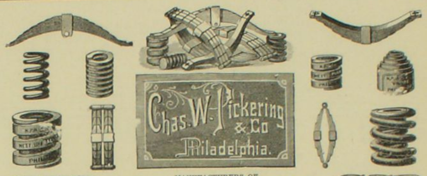

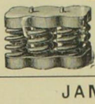

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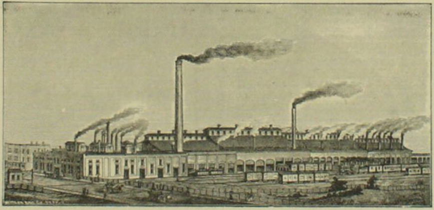

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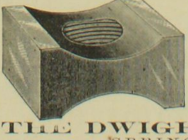

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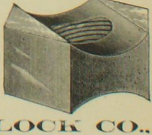

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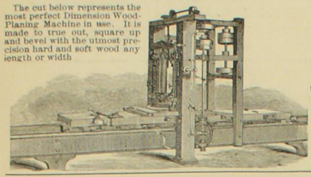

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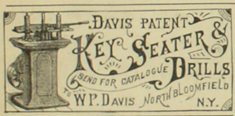

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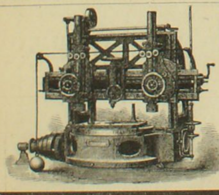

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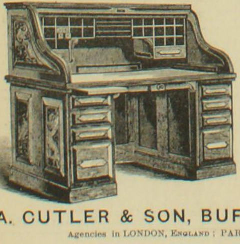

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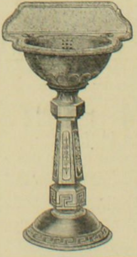

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